Technical Report 1212

Enlisted Personnel Allocation System (EPAS) Enhancements to the Recruit Quota System (REQUEST) – A Simulation Evaluation

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14. ABSTRACT *(Maximum 200 words)*:

The Enlisted Personnel Allocation System (EPAS) is an automated classification methodology that allocates applicants to jobs so as to maximize predicted performance while meeting accession requirements. It is designed to work as a subsystem of the Recruit Quota System (REQUEST). For this project the "operational" EPAS implemented an EPAS-enhanced REQUEST (EER) procedure in which MOS opportunities identified by REQUEST are reordered by EPAS optimization results. Although previous evaluations provided evidence of the utility of EPAS, none of them had addressed the EER.
This field test evaluated the EER using a non-intrusive, but highly realistic simulation framework. It compared the EER and REQUEST in terms of classification efficiency and capability to meet Army accession requirements. The results of the analysis indicated that using EPAS to reorder the REQUEST opportunity list could increase the visibility of opportunities in which an applicant would be likely to perform well, while extracting only a small penalty on the visibility of priority MOS. Despite the positive effect of EPAS on the opportunity lists, there was essentially no difference in the average predicted performance between the two conditions. The lack of a performance difference between REQUEST and the EER reflects more realistic understanding and modeling of applicant job-choice behavior and a possible loss in the classification efficiency of the ASVAB test battery. The authors discuss the limitations of the EER design, and make a case for extending the simulation capability to fully utilize the EPAS optimization results.

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Enlisted Personnel Allocation System (EPAS) Enhancements to the Recruit Quota System (REQUEST) – A Simulation Evaluation

EXECUTIVE SUMMARY

Research Requirement:

The classification process, in which the Army assigns enlisted personnel to their initial training for Military Occupational Specialties (MOS), must provide sufficient numbers of qualified individuals for each of over 150 entry MOS required to sustain the enlisted force. The Enlisted Personnel Allocation System (EPAS) is a classification methodology that identifies the personnel allocation that maximizes the predicted performance of an accession cohort while meeting Army fill, distribution, and timing requirements. EPAS was developed in several iterations over a period of more than 20 years. The most recent version of EPAS, termed operational EPAS, was designed to be a component of the Recruit Quota System (REQUEST) that the Army currently uses to assign new recruits to their initial MOS training. The operational EPAS prototype implemented an EPAS-enhanced REQUEST (EER) procedure in which MOS training opportunities identified by REQUEST are reordered according to the optimization results produced by EPAS.

The results of evaluations of earlier versions of EPAS provide strong evidence that it can improve the aggregate Aptitude Area (AA) composite score of a fiscal year cohort, while simultaneously meeting priority Army accession requirements. However, none of these evaluations addressed the proposed EER. This field test evaluates whether the previous findings can be realized in an actual recruiting environment, where the operational EPAS prototype is used to enhance the output of REQUEST in a realistic simulation.

Procedure:

A field test was conducted within a non-intrusive simulation framework that maintained a high degree of operational realism. The EER system, which uses the results of an EPAS optimization as an index to reorder training opportunities generated by REQUEST, was the focus of the field test. Its classification efficiency and capability to meet Army accession requirements were compared to the current REQUEST system within the simulated environment. The test also compared the MOS training opportunities identified by EPAS to those generated by REQUEST in order to examine the extent to which EPAS could impact recruit training opportunities in an operational environment.

To satisfy the requirement for realism, we based the field test on transaction data extracted from the REQUEST system for actual applicants during Fiscal Year (FY) 2002. These data include applicant demographic data and aptitudes, the training opportunities (consisting of an MOS, training start date, and enlistment incentives) presented to the applicants, and their actual choices. In addition, we obtained fill requirements and training seat quotas from the Human Resources Command (HRC), Enlisted Personnel Management Directorate (EPMD). To

satisfy the requirement to conduct a non-intrusive evaluation, we used simulation methods as the basis for the test. The engine for this evaluation is an empirical job choice model (JCM) that expresses the choice probability for a training opportunity as a function of its rank on the list of available opportunities, in addition to other factors such as MOS, enlistment incentives, and applicant aptitude and demographic variables.

Findings:

The results of the analysis indicate that use of EPAS to modify the list of opportunities produced by REQUEST can increase the visibility of opportunities in which an applicant would be likely to perform well, given his or her aptitudes. The overlap between EPAS guidance and the REQUEST list was substantial, and the opportunities that were included in both lists had substantially higher average AA than the REQUEST opportunities that were not included in the EPAS guidance. Furthermore, increasing the prominence of the opportunities identified by EPAS extracts only a small penalty on the visibility of priority MOS. Despite the substantial and largely positive effect of EPAS on the opportunity lists, however, there is essentially no difference in the average AA composite score between the two conditions. The lack of improvement from the use of the EER appears to be caused, in part, by the characteristics of the applicant job-choice process and the formulation of the AA composites that are used to predict performance.

One critical element of the classification process that had not been addressed in earlier EPAS evaluations is the applicant's choice of MOS and training date from the available opportunities. Analysis of the empirical job choice model used in this evaluation indicated that rank in the list had a relatively small impact on applicant job choice, and that only some Army job counselors are able to persuade applicants to choose the high priority jobs at the top of the REQUEST list. In addition, it indicates that applicants already tend to choose jobs in which they are expected to perform well, limiting the ability to improve job choices by reordering the alternatives. The contribution of the rank order term to total utility of the applicant represents a "partial effect" in the sense that it accounts for the applicant's utility not already explained by monetary incentives and other factors included in the utility function. Since monetary incentives and rank order are highly correlated by design, failing to properly account for monetary benefits will overestimate the role of guidance counselors in applicant selection of high ranking MOS alternatives.

Utilization and Dissemination of Findings:

The results can be used to specify better ways to integrate EPAS with REQUEST. For example, the results of an EPAS optimization should be allowed to add MOS for which the applicant would be expected to perform particularly well to the opportunities produced by REQUEST. Similarly, EPAS could be used to eliminate non-critical MOS for which the applicant's performance is barely above the standard. In addition, the results have implications for improving the EPAS optimization. Finally, the empirical job choice model can provide a useful tool for evaluating changes in recruiting policy, such as bonuses and other incentives, that affect job choices.

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INTRODUCTION

The classification process is one in which the Army assigns enlisted personnel to their initial training for Military Occupational Specialties (MOS). This process must satisfy several potentially conflicting requirements. It must provide sufficient numbers of qualified individuals for each of over 150 entry MOS required to sustain the enlisted force. The assignment process must pay particular attention to filling a smaller number (approximately 25) of high priority MOS (e.g., 11X Infantry). It must also assign recruits in a manner that facilitates efficient use of training resources. Thus, a relatively steady flow of recruits should be provided for each MOS to match the training schedule. Finally, the classification process should assign recruits to the MOS that provide the best match to their abilities and interests, so that the overall performance of the enlisted force is maximized and attrition minimized.

The Enlisted Personnel Allocation System (EPAS) is a classification methodology that identifies the personnel allocation that maximizes the predicted performance of an accession cohort while meeting Army fill, distribution, and timing requirements. It recommends the allocation based on MOS accession requirements, the available seats in initial skill training classes, and an estimate of the supply of recruits with associated demographic and aptitude information.

EPAS was developed in several iterations over a period of more than 20 years. Table 1 compares the characteristics of the three major versions of EPAS. The initial research (Konieczny, Brown, Hutton, & Stewart, 1990) was part of ARI's Project B and investigated techniques that could support real-time personnel allocation as performed by the Recruit Quota System (REQUEST). The resulting prototype, termed Research EPAS, partitioned applicants into 50 supply groups (SGs) and determined the optimal allocation of these SGs to 60 MOS clusters. Although a network optimization algorithm was used to determine the optimal allocation in early phases of the development, a linear programming (LP) optimization algorithm was used in the final version of Research EPAS. The primary output of the algorithm was the EPAS Optimal Guidance (EOG), which could be used to rank order optimal or near-optimal MOS clusters for each SG in terms of their contribution to (an approximation of) the mean predicted performance of the allocation. The EPAS system as developed was able to demonstrate many aspects of REQUEST functionality within its optimization framework.

The second iteration of EPAS, termed PC-EPAS (Greenston, Mower, Walker, Lightfoot, Diaz, McWhite, & Rudnik, 2001), moved the software from the mainframe on which it was originally hosted to a personal computer (PC) environment. PC-EPAS increased both the number of SGs and the number of constraints considered by the optimization (see Table 1). In addition, the software incorporated two modes, a planning and a simulation mode. In the annual planning mode, a projected population of applicant SGs was allocated to MOS clusters, producing an EOG for each SG. In the monthly simulation mode, individual applicants for the month were assigned to the MOS with the highest rank in the EOG for which they were qualified.

Table 1. Features of Major EPAS Versions

Feature	EPAS Version		
	Research EPAS	PC EPAS	Operational EPAS
Dates	1982-1990	1994-1995	2000-2004
Platform	IBM mainframe	PC	Server
Algorithm	Initial – Network optimization Final – Linear Program	Linear Program	Linear Program
Frequency of Update	Monthly	Monthly	Monthly
Supply Groups	50	91	91, with capability to increase
MOS Clusters	60	57	150, i.e., individual MOS
Objective Function	9 Aptitude Area (AA) scores – unit weighted Armed Services Vocational Aptitude Battery (ASVAB) subtests	9 AA scores – unit weighted ASVAB subtests	9 Predicted Performance (PP) scores – least squares weighted ASVAB subtests. Flexibility to add more job families.
Constraints	1. Monthly total accessions 2. Annual training requirements by MOS cluster 3. Annual training capacity by MOS cluster 4. Annual quality distribution by MOS cluster	1. Monthly total accessions 2. Annual training requirements by MOS cluster 3. Monthly MOS cluster class seats 4. Annual quality distribution by MOS cluster 5. Annual HSDG goal by MOS cluster 6. Annual Cat 4 limit by MOS cluster	1. Monthly total accessions 2. Annual (training) requirements by MOS 3. Monthly MOS class seats 4. Monthly fill requirements for top 25 priority MOS
Evaluation Sample	Random sample of 10,000 applicant contracts for Fiscal Year (FY) 1987	All FY 1991 contracts	EPAS-enhanced REQUEST (EER) tested in current research using all FY 2002 contracts
Job Choice Model	Select from top of EOG	Select from top of EOG – often required long list	Empirical job choice model based on REQUEST transaction data

Operational EPAS was designed to be a component of the REQUEST system that the Army currently uses to assign new recruits to their initial MOS training (McWhite & Greenston, 1997; Greenston et al., 2001). In the proposed EPAS-enhanced REQUEST (EER) system, REQUEST identifies a list of MOS training opportunities for which an applicant is qualified. The results of an EPAS optimization are then used to identify the MOS in the REQUEST list for which the individual is likely to perform with the greatest effectiveness. The EOG is used to reorder the MOS training opportunities in the REQUEST list so that MOS higher on the EOG are shown to the applicant before those lower on the list. Opportunities from REQUEST that are not included on the EOG are placed at the end of the list.

The Operational EPAS prototype implemented the EER to examine the substantive impact of integrating EPAS and REQUEST. It also added considerable flexibility regarding the number of SGs and MOS used in the optimization, eliminating the need to combine MOS into clusters. In addition, it improved upon the way that the distribution of aptitude within an SG was characterized in the optimization, as described in the following section.

During the time in which EPAS was developed, there were changes in the Aptitude Area (AA) composites used to estimate applicant performance and forming the basis of the objective function maximized by EPAS. From the early 1970s until recently, the Army employed a system of nine AAs expressed as unit-weighted composites of subtests of the Armed Services Vocational Aptitude Battery (ASVAB). The specific subtests included in each composite were chosen based on a combination of empirical analyses and judgments of subject-matter experts regarding the job-subtest linkages. Starting in January 2002, the Army replaced the unit-weighted composites with a set of nine composites based on empirically estimated regression weights reflecting the criterion-related validities for the ASVAB subtests (Greenston, Rumsey, Zeidner, & Johnson, 2001). Because of the way that they were developed, these composites are termed Predicted Performance (PP) composites. It should be noted, however, that the composites are standardized to have similar means and standard deviations. As a result of standardization, composites with lower validity (less variability in PP over the applicant population) have the same impact on the EPAS objective function as those with higher validity. Both Research EPAS and PC-EPAS measure performance using the unit-weighted AA composites. This evaluation of the EER uses data from the time that the transition was made between the unit-weighted AA composites and the regression-weighted PP composites.

The results of evaluations of earlier versions of EPAS provide strong evidence that it can improve the aggregate AA composite score of a fiscal year cohort, while simultaneously meeting priority Army accession requirements. However, none of these evaluations addressed the proposed EER, nor could they assess effects of the use of regression-based composites. In addition, the previous evaluations were based on very limited information about the MOS training opportunities generated by REQUEST, which made it difficult to estimate any improvement due to the use of EPAS. This field test evaluates whether the previous findings can be realized in an operational environment, where the EPAS prototype is used to enhance the output of REQUEST in a realistic simulation.

Goals of the Field Test

The primary goal of the field test is to evaluate the performance of the EER system using a realistic, but non-intrusive procedure. The overall evaluation considers the following questions:

- Would incorporating the output of EPAS optimization into REQUEST be expected to improve the mean predicted performance (MPP) of an applicant cohort?
- Does the EOG overlap sufficiently with the REQUEST list so that the reordering process can affect the ranking of a large portion of the list?
- To what extent can the potential improvement in MPP due to the use of EPAS be realized under realistic conditions that consider actual applicant aptitudes and job training choice processes?
- Does the use of EPAS have any negative impact on the ability of the Army to meet accession goals, especially for high priority MOS?
- Do changes in the links between SGs and MOS developed for the Operational EPAS prototype (Diaz & Ingerick, 2004b) improve the MPP of the applicant cohort, compared to the methods used in previous versions of EPAS?

In meeting these overall research goals, we have had to consider the conflicting desires to be both realistic and non-intrusive in the field test design. To satisfy the requirement for realism, we based the field test on transaction data extracted from the REQUEST system for actual applicants during Fiscal Year (FY) 2002. These data include applicant demographic data and aptitudes, the training opportunities (consisting of an MOS, training start date, and enlistment incentives) presented to the applicants, and their actual choices. In addition, we obtained fill requirements and training seat quotas from the Human Resources Command (HRC), Enlisted Personnel Management Directorate (EPMD). To satisfy the requirement to conduct a non-intrusive evaluation, we used simulation methods as the basis for the test. The engine for this evaluation is an empirical job choice model (JCM; Diaz, Ingerick, & Sticha, 2007) that expresses the choice probability for a training opportunity as a function of its rank on the list of available opportunities, in addition to other factors such as MOS, enlistment incentives, and applicant aptitude and demographic variables. The JCM allows us to predict applicant choice probabilities from the REQUEST and EER lists in a non-intrusive, simulated environment.

Organization of the Report

This report describes the method and results of the EER field test and discusses the implications of these results. First, we present background that briefly describes both REQUEST and EPAS and outlines the procedures that are used to merge the results of these two methods. It also summarizes the results of previous evaluations of the MPP improvements obtained from using EPAS. The report then describes the analytical and simulation methods that were used in the field test. The analyses review the outputs of the EPAS optimization, compare the EOG to the REQUEST list, and examine whether the use of EPAS leads to an improvement in MPP. Finally, we present the results of analyses and simulations and discuss the implications of these results on the potential for the use of EPAS and on the course for future classification research.

BACKGROUND

Previous research that defined EPAS and specified how it should interact with REQUEST provides the context for understanding the current field test and interpreting its results. In this section, we present a brief overview of EPAS and describe the way that is proposed for it to enhance the list of opportunities produced by REQUEST. We also summarize research that has examined potential classification gains using EPAS.

Overview of REQUEST

The Recruiting Quota System (REQUEST) is a real-time person-job reservation system for matching applicants to initial MOS training and training start dates based on applicant qualifications, date(s) applicant can start training, and training seat availability. The REQUEST server provides the career counselor and applicant with a list of alternative assignments. The counselor uses this list, which may contain as many as 30 training opportunities, as the basis for negotiating the MOS training assignment.

The U.S. Army Recruiting Command (USAREC) Delayed Entry Program (DEP) Controls determine the visibility of MOS training seats to the career counselor and applicant. Each MOS is assigned to a single DEP table that defines the extent of its visibility over the next 52 weeks as well as the demographic groups that can see it.[1] MOS seat visibility is managed with the goal of meeting accession mission, and is broadly controlled by week of accession, gender, education level, and Armed Forces Qualification Test (AFQT) category. Given the applicant's window of availability, REQUEST will determine which training opportunities the applicant qualifies for – from among those allowed by DEP Controls – by considering Aptitude Area composite scores, AFQT category, education level, and other specific qualifications (e.g., visual acuity, ability to swim, drivers license). Finally, REQUEST will rank the "visible/allowed and qualified for" seats, taking into account MOS priority, year-to-date (YTD) fill, remaining annual training requirements, and other factors. Those ranking highest are placed at the top of the list of training opportunities presented by REQUEST, where the career counselor is trained to sell from the top.

The content of the REQUEST list is also determined by the type of query that the counselor sends to the system. The query specifies the applicant's window of availability and can also be used to search for specific MOS. In addition, applicants may enter several different queries as they examine and refine their job preferences in preparation for their selection of initial MOS training. Some applicants meet with their career counselor on more than one occasion. When the applicant has chosen an MOS, the career counselor uses REQUEST to make a reservation for the training course. The recruit is then sworn into the Army and typically placed into the DEP.

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[1] Five DEP tables are currently used: (a) *Normal* is the standard policy that reflects the current health of the DEP bank; as of this writing, the availability of MOS in the Normal table extends only four weeks. (b) *Now* implies that the Month 2 target is met but the Month 1 Target is not met, so the MOS remains open for the remainder of Month 1. (c) *Future* means that the Month 1 target is met, so availability shifts to the next target. (d) *Hard Starts* provides extended availability to fill hard starts. (e) *Controlled* gives no availability.

Overview of EPAS

The EPAS optimization model produces an allocation of forecasted supply to initial MOS training to maximize the predicted performance of the applicant cohort. The version of EPAS as tested (i.e., the EER with particular merge rules) is designed to operate with REQUEST in a two-phase process. In the first phase, a linear programming model allocates the forecasted recruit supply to MOS so as to maximize the objective function while meeting Army fill requirements and other constraints. The model is solved to determine the allocation of applicant supply groups to initial MOS training that maximizes predicted performance for the recruit cohort, while meeting accession and training management constraints. The model solution is updated periodically and used to generate an ordered list of MOS training recommendations for each SG. In the second phase, that of actual applicant assignment, applicants are first categorized into SGs by their demographic and aptitude profiles. Then the recommendation of EPAS for each applicant's SG is used to reorder the list of training opportunities generated by existing REQUEST procedures and presented to the applicant by the career counselor.

Input to EPAS

Input to the EPAS optimization specifies the supply of contractees who must be assigned jobs, the fill requirements for each MOS, and the schedule of available MOS training. A more detailed specification of input requirements summarized below is shown in Appendix B.

- *Applicant supply forecasts.* Supply data refer to the expected flow of applicants signing enlistment contracts by month and by SG. Since EPAS is run at the beginning of a year (and updated monthly or even weekly), it must rely on expected rather than actual supply. EPAS initially derives a 12-month forecast of monthly enlistment contracts, by number and applicant SG, from the USAREC gross contract non-prior service (NPS) mission and uses this estimate to represent the "supply" side of the optimization model.
- *MOS accession requirements.* EPAS uses three measures of requirements: (a) total monthly accession across all MOS, (b) monthly accession for top-25 priority MOS, and (c) annual fill for each MOS. At the start of an FY, the Army G-1, Directorate of Military Personnel Management (DMPM) develops (and subsequently updates) an accession mission statement, consisting of total monthly accession requirements by enlistment type and gender and overall quality goals, and identifies high priority MOS for which HRC/EPMD develops monthly targets.
- *MOS training seat availability.* In determining the optimal allocation, the EPAS model is constrained by the number of training seats that are available for initial MOS training (i.e., by MOS and training start month). HRC/EPMD/AMB (Accession Management Branch) manages seat availability and quotas for each MOS, and coordinates adjustments with the U.S. Army Training and Doctrine Command (TRADOC) through the Training Resource Arbitration Panel (TRAP) process, using the Army Training Requirements and Resources System (ATRRS) to communicate quotas and schedule with REQUEST.

EPAS Optimization

The objective function that EPAS seeks to maximize represents the aggregate predicted performance (i.e., the total AA composite score) of the forecasted supply in their assigned MOS. For each SG and MOS, the objective function multiplies the number assigned from the SG to the MOS (i.e., the fill) by the SG's average score for the governing composite associated with the MOS. Prior to January 2002, the average was based on the unit-weighted AA composites, while after this date the average was based on the regression-weighted PP composites. In either case, the relevant composite score is the estimate of performance that is maximized by EPAS. The overall value of the objective function is obtained by summing the predicted performance over all SG and MOS.

The solution produced by the Operational EPAS allocation model prototype must satisfy the constraints listed below. The model allocates contractees (91 supply groups by 12 contract months) to initial MOS training and training start month (approximately 150 MOS and up to 24 accession months).

- Total fill across MOS and accession months cannot exceed total supply for each supply group and contract month.
- The fill (i.e., number of assignments) to an MOS and training start month cannot exceed the number of seats available for that MOS and month.
- The total fill in a given month must meet or exceed the total accession goal for that month.
- The fill must meet or exceed annual requirements for each MOS.
- The fill for high priority MOS (approximately 25 MOS) must meet or exceed the minimum requirements for each of those MOS for each month in the current fiscal year.

The optimization considers only those initial MOS training opportunities with start dates that are allowed by DEP Controls. Other distribution constraints, including AFQT category and gender constraints, have been included in the EPAS code, but were deactivated for this field test.

EPAS Optimal Guidance

EPAS produces a list of MOS training assignments for each SG, which is called the EOG. The MOS job training opportunities in this list are ranked from high to low in terms of the maximum total predicted performance of solutions assigning members of that SG to each MOS. That is, the EOG ranking combines the optimal solution with the results of a number of near-optimal solutions. The difference between the value of the objective function between a near-optimal solution and the optimal solution is termed the reduced cost of the solution. The reduced cost for an MOS represents the change in the objective function that would result from increasing a particular SG's flow to that MOS while reducing its flow to one or more others. MOS included in the optimal solution have a reduced cost of zero; other MOS have negative reduced cost.

The length of the EOG can be varied by establishing a criterion level of reduced cost for inclusion in the EOG. As the reduced cost criterion increases in absolute value (grows increasingly negative), more MOS opportunities are included in the EOG. The increased length of the EOG means that there will be more MOS in common with the REQUEST list. However, the MOS that are added at large values of reduced cost are from increasingly worse solutions. At some level of the criterion, adding more MOS to the EOG may not further increase the performance of the EPAS-enhanced REQEST list. One issue that will be examined in the field test concerns the best level for the reduced cost criterion.

SG-MOS Connection Enhancements to EPAS

The EPAS optimization model employs SGs to formulate its optimal recruit-MOS matching solution, both to reflect limits in the level of detail possible in enlistment supply forecasts and to reduce the computational load required for the optimization. As a result of the optimization, EPAS generates the EOG for each SG to rank potential assignments for that group. Two issues arise from employing SGs as proxies for individual recruits in the EPAS optimization. The first issue is how to represent the predicted performance of *all* applicants belonging to a supply group as a single "cost value" in the optimization. The second issue is how to implement cut scores, which are used to determine individual applicant eligibility for an MOS, at the SG level in the optimization. The method used to resolve these issues is termed the SG-MOS connection approach.

The EPAS Functional Description (Greenston et al., 1998; 2001) described an SG-MOS connection approach in which the ordinary SG mean for the governing AA composite score for an MOS is used to represent the predicted performance of all individuals in that SG for that MOS. The ordinary SG means are then compared to the cut score of the MOS. If the mean is above the cut score, it is used to represent the "cost value" of the SG for the MOS in the optimization routine. Conversely, if the mean is below the cut score, a zero is used to represent the "cost value," signifying that no connection is permitted between the SG and the MOS in the optimization.

The characteristics of the approach raise concerns for slightly different, albeit related, reasons. First, the use of ordinary means to represent all applicants in an SG likely underestimates the predicted performance of recruits belonging to the SG who are eventually assigned to the MOS, because the mean is based on all applicants, including those who do not meet the MOS cut score. A second concern with the current approach is that constraining SG means to be above the cut score could yield a disparate negative impact on low-aptitude (or hard-to-place) recruits. Lower-middle aptitude recruits with AA scores in the neighborhood of many MOS cut scores could also be affected. This result comes about because constraining the SG means to be above the cut score likely eliminates from consideration some MOS for which these individuals are qualified.

Diaz and Ingerick (2004b) refined the SG-MOS connection to improve the optimization of the recruit-MOS matching routine used by EPAS. There were two parts to this proposed modification. First, new AA score profiles for input to the EPAS optimization were computed for each SG using *truncated* SG means, as opposed to the *ordinary* SG means EPAS previously used. That is, the mean for a specific SG only considered those members of the SG with AA scores above the cut score for an MOS. Second, connections between all SGs and MOS were permitted during EPAS optimization, in contrast to the original approach in which SGs were eliminated from consideration to an MOS if their AA means were below the MOS cut score.

Diaz and Ingerick calculated the truncated means as a function of AA cut score for non-prior service Army recruits from FYs 1997-2001, supplemented with FYs 1994-1996 (for hard-to-fill SGs). Using pre-existing SG centroids from the EPAS Functional Description, recruits were assigned to the SGs that best matched their demographic information (gender, education level, AFQT category) and profiles of scores on the ASVAB tests. Then truncated SG means were calculated for two sets of 10 AA composites (unit-weighted and regression-weighted). Cut scores ranged from 80 to 120, which encompasses the full range of cut scores currently in operational use. Truncated SG means were computed by averaging the relevant AA composite scores for those recruits within an SG scoring at or above a given cut score value. After the truncated SG means were computed, they were compiled for use by EPAS.

Initial simulations run on a simplified classification problem indicated that the use of truncated means had the potential to improve the MPP obtained, compared to the ordinary mean. In addition, evaluation of the new SG-MOS connection with a truncated mean suggested that it could substantially improve the potential for EPAS to optimize the REQUEST system in two ways. First, elimination of the application of cut scores at the SG level leads to more MOS being available for assignment to each SG. Second, using truncated SG means (instead of ordinary means) yields SG "cost values" in the optimization that are more representative of the predicted performance of applicants in the MOS that would be coming from the SG. The results of this field test should provide a more comprehensive and realistic evaluation of the modified SG-MOS connection.

EPAS Enhanced REQUEST

The present EER represents the least intrusive implementation of EPAS in an operational environment. The approach taken is to run periodic EPAS optimizations throughout the year to produce an EOG that reflects the current fill and allocates expected future supply to unfilled training opportunities. The EOG calculated from these optimizations would then be used to control the order that opportunities identified by REQUEST would be presented to the applicant. That is, the EOG would serve as an index to reorder the opportunities generated by REQUEST. This approach is designed to partially capitalize on the EPAS optimization results, while allowing the REQUEST system to identify opportunities that meet immediate Army needs.[2]

The basic procedure by which the current EOG would be used to reorder the REQUEST list for a single applicant is outlined in the following list.

1. The demographic and aptitude information from an applicant are used to assign the applicant to an SG. The applicant is assigned to the most similar SG, that is,

[2] Note that the EPAS allocation model is also constrained to produce a solution that meets immediate Army needs.

the SG with the same gender and educational level, and the closest match to aptitude scores using a Euclidean distance metric.

2. The EOG from the applicant's SG is retrieved. The EOG includes a list of training opportunities, including both MOS and training date, along with a reduced cost value for each opportunity.
3. The applicant and career counselor make a query of the REQUEST system specifying the window of availability for accession and potentially other factors.
4. The REQUEST system produces a list of training opportunities for which the applicant is qualified.
5. The reduced costs from the EOG are used as an index to reorder the opportunities in the REQUEST list. Opportunities on the REQUEST list that are not included in the EOG are placed at the end of the reordered list. The reordered list is the EER.
6. The reordered opportunity list is presented to the applicant.

Where there are discrepancies between the two lists of assignments, the non-overlapping EPAS assignments are dropped, while the non-overlapping REQUEST assignments are retained and placed at the bottom of the list in the order in which they were output by REQUEST. This procedure helps to ensure that critical accession requirements are not eliminated from the EER. This specific EER is the ultimate focus of this field test. Its classification efficiency and capability to meet Army accession requirements are compared to the current REQUEST system in an operational environment. The field test also compares the MOS training opportunities in the EPAS list with those in the REQUEST list, in order to examine how EPAS impacts recruit training opportunities under an operational environment.

Previous EPAS Evaluations

Previous evaluations of EPAS or a similar batch optimization process have taken two different approaches to assess and quantify the benefits brought about by its use. Planning mode evaluations have compared the value of the objective function for an optimal allocation produced by EPAS to several statistics describing the distribution of aptitudes in the supply population. Simulation evaluations have used optimization results along with other information and assumptions to assign each of a set of hypothetical applicants to an MOS training alternative. In both of these types of evaluation, the benefits are measured in terms of the predicted performance of a cohort, expressed as average AA or PP composite scores. To quantify the benefits of EPAS in a monetary metric, a third line of evaluation research has attempted to document sources of cost savings or avoidance associated with improved classification efficiency. These three lines of evaluation research present a consistent picture of the value of EPAS, showing reliable and practically meaningful improvements in classification efficiency from its use.

Planning mode studies compare the predicted performance from an optimal allocation of applicants to MOS—measured by the objective function of the optimization—to the actual choices of applicants or to statistics that describe the applicant aptitude distribution. Typical statistics used in these comparisons are averages, representing the results of random job assignments, and maxima, representing the best that could be obtained irrespective of constraints such as training seat availability, distribution requirements, and so forth. For example, Rudnik and Greenston (1996) found that the average AA score of a PC-EPAS solution for FY 1991 applicants (113.2) was substantially greater than the average AA score of their actual choices (110.1). Furthermore, the average AA score for the optimal allocation was relatively stable as assumptions about the characteristics of the applicant population and accession policy were varied.

Analyses by McWhite[3] compared the results of PC EPAS to a wider variety of contractee aptitude distribution statistics using data from FY 1997, as shown in Table 2. He also reproduced comparable results from an earlier evaluation of Research EPAS using FY 1984 data (Schmitz & McWhite, 1986). The results indicate that both versions of EPAS show an approximately 3-point advantage over the average AA of the actual applicant choices. The fact that the average contractee AA (which indicates the AA of the actual assignments) is greater than the random assignment average AA (which is the overall average of all AA composite scores for each applicant) indicates that the existing classification system using REQUEST has some classification efficiency, compared to random assignment to MOS. In addition, partitioning the applicant population into supply groups leads to some loss in efficiency compared to assigning individual applicants to their best AA composite, as indicated by the fact that the maximum contractee AA (114.4 and 114.2 for FY 1984 and FY 1997, respectively) is higher than the maximum SG AA (110.8 and 111.5). In both cases, the planning mode EPAS results are nearly as good as possible, given the supply groups that were used.

Table 2. Comparison of EPAS Results to Applicant Distribution Statistics (from McWhite)

	PC-EPAS	**R-EPAS**
Contractee Aptitude Distribution Statistics		
Maximum Contractee AA	114.2	114.4
Maximum SG AA	111.5	110.8
Maximum SG AA without Category IV	111.7	111.5
Average Contractee AA	108.5	108.0
Random Assignments Average AA	105.9	106.7
Simulation of REQUEST Only	107.0	109.9
EPAS Results		
Planning Mode	110.6	110.1
Simulation/Top of List	110.5	110.1

Although planning mode evaluations give a good indication of the potential of EPAS to improve the predicted performance of an applicant cohort, they are not a good predictor of actual performance because they do not consider several of the factors that affect the assignment process. For example, an individual applicant may have lower scores on some AA composites than the average for his or her supply group, and hence may not qualify for an MOS that is optimal for the supply group. Similarly, an optimal MOS may be filled or may have other

[3] Peter B. McWhite (1999), *EPAS Optimization Performance Analysis.* Rockville, MD: Engineering Insights.

requirements (e.g., physical, language, drivers' license, etc.) that are not considered by EPAS. Evaluations based on simulation can avoid some of these issues and, consequently, offer a more realistic evaluation of EPAS.

Greenston et al. (2001) give a brief description of a simulation evaluation of EPAS. This process begins with the calculation of the optimal allocation of supply groups to MOS training opportunities over the planning horizon and the calculation of the EOG. Each applicant in the first month is then assigned to an MOS training opportunity based on the EOG. The specific assignment can be made in any of the following ways: (a) taking the training opportunity at the top of the list, (b) randomly selecting an opportunity from the top 5 on the list, or (c) randomly selecting an opportunity from the top 25 on the list. When all the applicants for a month have been assigned, the requirements and available seats are updated, and the cycle is repeated for the second month. This process continues until 12 months of applicants have been processed.

Simulation evaluations of EPAS have consistently shown that the system has the potential to increase the aggregate performance of Army recruits. For example, the results presented in Table 2 show that a simulation of EPAS leads to an average AA estimate that is nearly as high as the planning mode results. Other results (e.g., Nord & Schmitz, 1989; Greenston et al., 2001) have indicated that the use of EPAS or a similar optimization process can produce approximately a 3-4 point improvement in average AA score. In addition, research (Johnson, Zeidner, & Vladimirsky, 1996; Zeidner, Johnson, Vladimirsky, & Weldon, 2000) has indicated that substantially greater improvements are possible when AA composites are based on full least squares (FLS) regression weights predicting performance, than when they are based on unit-weighted sums of individual ASVAB tests.

Evaluation of the practical significance of such a difference has taken two approaches. The first approach looks at the opportunity cost of the current classification system. That is, it estimates the cost required under the current system to obtain an average performance equivalent to that of EPAS. In the current system, average performance can be improved by recruiting a larger proportion of high aptitude individuals (i.e., in AFQT Categories I-IIIA). The additional cost required to recruit high aptitude youth is known and can be used to quantify the benefit of EPAS in dollar terms. Estimates of annual opportunity cost using 1997-98 data were in the range of $159M to $272M (Greenston et al., 2001). A second approach to the valuation of EPAS looks at its effect on attrition reduction (Greenston, Nelson, & Gee, 1997). The results of this study estimated an $8.5M annual savings due to the reduced attrition coming from optimal job-person matching.

All previous evaluations of EPAS share several limitations. First, they have only limited information about the current REQUEST system. Because they do not have information about the training opportunities presented by REQUEST to each applicant, they cannot examine whether the REQUEST system has any effect on classification efficiency. Furthermore, without REQUEST information at the individual level, evaluations cannot calculate the EER or evaluate its performance in terms of its average AA score or predicted performance. Greenston et al. (2001) attempted to get around this problem by defining a "pseudo REQUEST" system that assigned to each applicant the opportunity for which they were qualified that had the earliest training date. Although this approximation captures some of the aspects of REQUEST, it is a considerable simplification and produces average AA scores that are somewhat lower than the actual assignments (See Table 2).

In addition, previous evaluations of EPAS have used simplified representations of applicant choices. These choice models have assumed that applicants choose uniformly from the top several opportunities (e.g., the top 5 or 25). In fact, applicants are provided with a wide range of up to 30 options in response to a query to REQUEST. In addition, they may make multiple queries with different assumptions. Several types of incentives are used to encourage applicants to pick opportunities that meet critical Army needs. Furthermore, the opportunities differ in the extent to which they conform to the applicants' interests or abilities. Indeed, applicants may already consider predicted performance in choosing an MOS (as was found by Diaz, Ingerick, and Sticha, 2007). Finally, counselors may differ in their ability to encourage applicants to select MOS that meet critical Army needs.

FIELD TEST SIMULATION METHOD

The current field test was designed to evaluate the use of EPAS as defined in its Functional Description (Greenston et al., 1998; 2001), as well as the enhanced SG-MOS connections that were developed since that time (Diaz & Ingerick, 2004b). The field test was conducted within a non-intrusive simulation framework that maintained a high degree of operational realism. The EER system, which uses the EOG as an index to reorder training opportunities generated by REQUEST, was the focus of the field test. Its classification efficiency and capability to meet Army accession requirements were compared to the current REQUEST system within the simulated environment. The test also compared the MOS training opportunities in the EOG to those generated by REQUEST in order to examine the extent to which EPAS could impact recruit training opportunities in an operational environment. In this section we describe the organization and operation of the simulation.

Simulation Organization

A key requirement of this effort is to develop a method of evaluating the potential benefits of EPAS enhanced REQUEST that would not affect actual classification operations. To meet this requirement, the field test design compared the current REQUEST training reservation system to an EPAS-enhanced REQUEST system using 12 months of actual data with an off-line simulation method (Lightfoot, Diaz, & Greenston, 2003).

The operational Army recruit classification system can be divided into the following four main components that are relevant to this field test: (a) the supply of Army applicants, (b) the demand to fill MOS training classes, (c) the process of managing the availability of MOS and training class opportunities for individual recruits through the REQUEST system, and (d) the decision-making process involved in assigning recruits to MOS training, which is conducted by Army counselors and recruits at the Military Entrance Processing Station (MEPS). The Army uses the REQUEST system managed by HRC/EPMD in conjunction with operators and analysts at USAREC and Army counselors at the MEPS to manage the flow of recruit supply and to ensure that MOS and training seat demand are met. In theory, guidance counselors work with a recruit's ASVAB test scores and career interests to identify a person-job match that balances Army accession requirements with the recruit's personal goals.

The classification simulation method combined actual and simulated versions of the preceding four components. The first two system components, which form the Army recruit classification environment, were represented by the actual supply of applicants and demand for filling Army jobs, organized by MOS and including quality distribution quotas covering the evaluation period. The third and fourth system components—accession management and classification—were represented in the off-line simulation by empirically derived procedures described in this section. These procedures satisfy the requirement to conduct an off-line field test that does not impact Army recruiting or classification operations.

Supply: Army Applicant Cohort Data

Evaluation of the potential benefits of an EPAS enhanced REQUEST system compared to the existing REQUEST was based on actual Army applicant cohort data for FY 2002. Depending on their time in the DEP, applicants from this cohort entered the Army in FY 2002 or 2003. These data were obtained from daily downloads from REQUEST. Although occasional problems with the download occurred, the obtained sample of 92,937 applicants represents the vast majority of the total cohort. A total of 78,298 of these applicants actually signed contracts and reserved a specific MOS and training date. Recruit data included ASVAB test scores, demographics, and physical and other attributes that are used for screening purposes.

Demand: MOS Vacancies and Available Training Seats

Although MOS training seat vacancies are available from the REQUEST system, technical difficulties with downloading precluded our use of this information in the field test. Consequently, we utilized information from two Army management reports created and updated by HRC/EPMD/AMB (Accession Management Branch). The first of these reports is the MOS Target Fill Report. This report provides the current and target fill by MOS and month. The current fill at the end of FY 2001 was used to specify the training fill requirements at the beginning of the simulation. Similarly, the target fill was used to determine the MOS training seat vacancies. The second report is produced by Army Training Requirements and Resources System (ATRRS), and is called the ATRRS Seat Quota for Regular Army. This report is a snapshot at the end of the year that documents the number of training seats that were used during the year as a function of MOS, Reception Station (RECSTA) date, and training start date. The number of seats in this report were inflated to account for DEP losses and then used along with the MOS Target Fill Report to approximate the number of unfilled seats at the beginning of FY 2002. Specifying the total number of seats for the two-year EPAS planning horizon required the use of the report for FY 2002 and 2003.

In the simulations, the numbers of unfilled MOS requirements and available training seats were updated as simulated recruits were assigned to MOS training class start dates throughout the evaluation period. As in the real world, unfilled class seats were considered lost as assignments moved past the class start date.

REQUEST MOS Training Opportunity List

A guidance counselor works with a recruit to select a MOS and training opportunity with a start date that corresponds to the recruit's availability. The basis of this recruit classification transaction is an MOS training opportunity list. REQUEST generates a list of up to 30 MOS class start date combinations for the counselor to review with the recruit.[4] EPAS enhancements to REQUEST are designed to affect the ranking of MOS training opportunities, and hence their likelihood of being selected inasmuch as career counselors are trained to sell from the top of the list.

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[4] If the recruit does not see a job in which he or she is interested or has a specific job in mind, then REQUEST also can generate a list of class start dates for a specific MOS.

We obtained individual training opportunities presented to applicants as a result of queries to REQUEST. This included the MOS, the RECSTA date, and information on enlistment bonuses, educational benefits and other relevant incentives related to the MOS choices available to the recruit. Due to an error by the REQUEST contractor in providing the download file, a maximum of six enlistment incentives were included for all opportunities during the period of the simulation. Consequently, incentive information was truncated for opportunities containing seven or more incentives. For these opportunities, incentives were reconstructed based on Army policy memoranda (Diaz & Ingerick, 2004a). The reconstruction process required changes to be made to 47% of all opportunities. In addition, some applicants conducted multiple queries on one or more dates. For analysis purposes, we only considered the queries conducted on the latest date before the reservation date. We merged the results of all queries conducted on that date to produce a single aggregated opportunity list. The MEPS location at which the queries were conducted and an identifier signifying the counselor who worked with the applicant were also recorded. The final data elements describe the recruit's actual MOS and training class choice.

Recruit MOS Training Opportunity Decision Process

The final component of the field test is a statistical decision-making model of recruit MOS training class assignments, which was developed from the database using econometric techniques (Diaz, Ingerick, & Sticha, 2007). In the simulation, the JCM plays the part of the actual transaction between a recruit and guidance counselor at the MEPS, which determines the recruit's MOS and training class choice. In this role, it is the key component that permits the design of an off-line evaluation strategy, allowing us to meaningfully recreate recruit MOS training class choices.

The JCM estimates the probability of the recruit selecting each training choice in a given list. During the classification simulation, assignment probabilities corresponding to the alternative MOS training choices in the REQUEST or EER list of a recruit are computed. These probabilities are a function of the MOS, the recruit ASVAB profile and demographics, the rank order of the training choices in the REQUEST list, and other transaction variables such as enlistment incentives and term of enlistment (see Figure 1). The probabilities, in turn, are incorporated in the simulation to determine a simulated recruit's "choice" of a training opportunity from a list. This choice involves a randomization process that allows the possibility of assigning the same simulated recruit to different training classes in different assignment replications. Although multiple, independent replications of the simulation are possible using different random number seeds, the actual evaluation included a single replication. The relative frequency distribution of recruit and MOS training choice attributes across many replications would follow the choice pattern found in the actual REQUEST transaction data from which the recruit choice model was estimated.

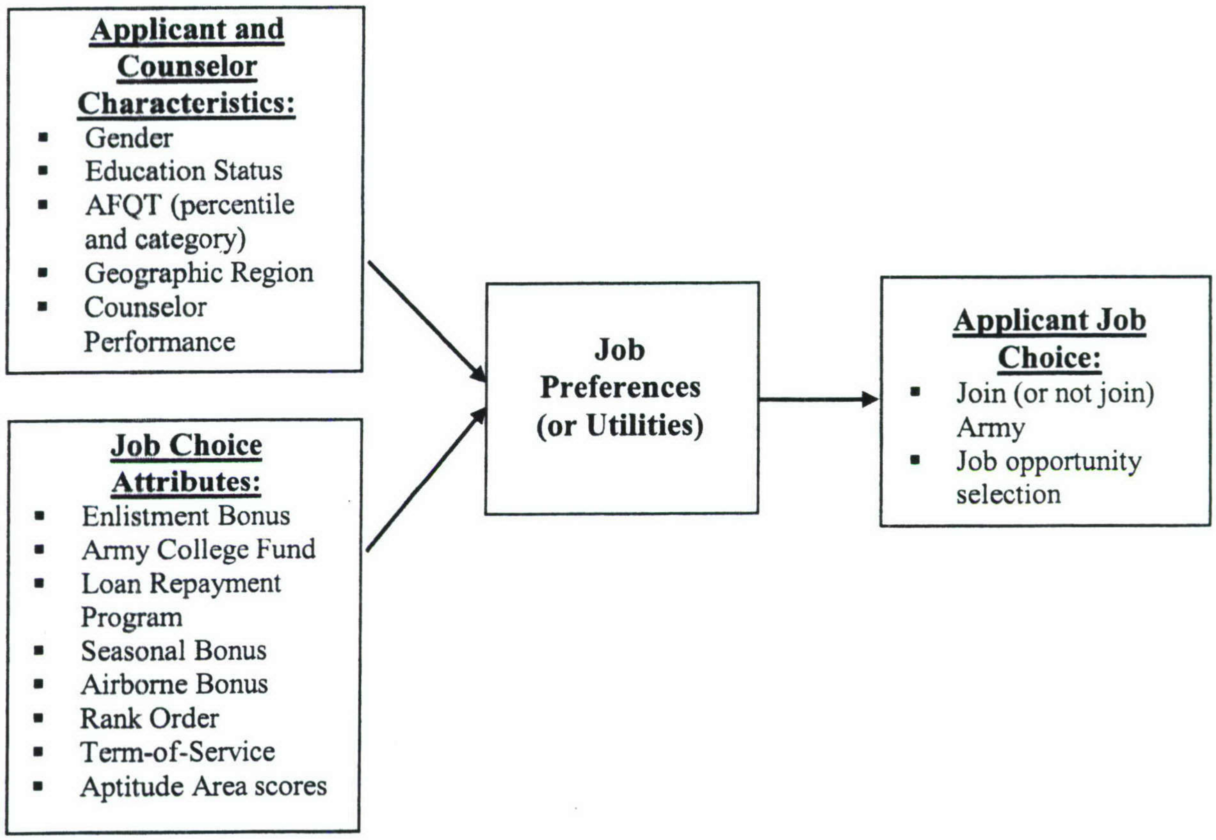

Figure 1. Applicant and Job Choice Attributes Included in the EPAS Simulation Job Choice Model (JCM)

As evident from Figure 1, the JCM posits that Army applicants' job-choice decisions are a function of their preferences or utilities associated with the different job opportunities presented. These preferences are related to: (a) characteristics of the applicant (i.e., gender, education level, cognitive aptitude, etc.); (b) attributes of the available job opportunities (i.e., monetary incentives, rank order, etc.); and (c) the guidance counselor processing the applicant. Consistent with the actual decision-making process, the JCM produces a model of applicants' choices sequentially, starting with their decision to join (or not join) the Army followed by their choice of specific job opportunity from the list of those presented at the time of enlistment.

While data on applicant and job opportunity attributes and applicants' actual job choices were available, applicants' preferences or utilities are latent (or unobserved) variables. To model these preferences, we applied discrete choice modeling and random utility theory. These modeling approaches have been widely used in econometrics to model consumer choice behavior (Greene, 1990) and, of particular relevance, in applied psychology to model Army enlistment and reenlistment behavior (e.g., Asch & Karoly, 1993; Hogan, Espinosa, Mackin, & Greenston, 2005).

The levels of incentives offered to different combinations of MOS and term of enlistment are set quarterly by an Enlistment Incentive Review Board (EIRB). To reflect these changes, the

JCM was developed and estimated separately for each quarter using the sample sizes and cutoff dates shown in Table 3 (from Diaz, Ingerick, & Sticha, 2007). As the table shows, the quarters in which incentive levels are set—referred to as "IRB quarters"—differ from FY quarters. All quarterly analyses contained in this report refer to IRB quarters.

Table 3. IRB Quarters and Sample Sizes

Quarter	Start Date	End Date	Total Size	Sample Size
1	October 1, 2001	December 3, 2001	14,236	4,085
2	December 4, 2001	March 3, 2002	22,049	4,390
3	March 4, 2002	June 2, 2002	24,264	4,395
4	June 3, 2002	September 30, 2002	32,407	4,421

Table 4 (from Diaz, Ingerick, & Sticha, 2007) shows the values and statistical significance of selected parameters of the JCM. The table indicates that among alternative-specific attributes, those that consistently exhibited significant effects on applicant choices across quarters are: (a) rank order of the MOS (B_Rnk); (b) counselor performance (B_RnkC); (c) Seasonal Bonus (SB) or Quick Ship incentive (B_SBd); and (d) AA score (B_AA). Estimates of the rank order coefficient are consistently negative and statistically significant for all quarters. Because alternatives at the top of the job list have lower numeric rank order values, it is important for this parameter to be negative for EPAS to have a positive impact on REQUEST. However, the overall weight of rank order is dependent on the performance of the counselor processing the applicant, which has a positive significant coefficient across quarters. The combined effect of this interaction is that the potential positive impact of EPAS on REQUEST can be expected from better-performing counselors but not from counselors performing poorly (in terms of "selling" from the top of the list).

Table 4. Selected Utility Weights and Scale Parameter Estimates by Quarter. Scaled for Second-Level Conditional MNL Model.

	First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Parameter	**Estimate**	**T-stat**	**Estimate**	**T-stat**	**Estimate**	**T-stat**	**Estimate**	**T-stat**
B_Rnk	-0.011977	**-2.97**	-0.007928	**-3.24**	-0.012900	**-3.44**	-0.021405	**-3.57**
B_RnkC	0.000386	**3.32**	0.000184	**3.40**	0.000317	**3.78**	0.000497	**3.82**
B_1sTEAb	0.053072	1.59	-0.004273	-0.23	-0.031338	-0.97	0.096952	**2.80**
B_SBd	0.077739	**2.78**	0.019529	**1.99**	0.040865	**2.09**	0.160683	**3.28**
B_SBSd	0.108585	1.33	0.068228	1.17	-0.231727	**-2.04**	-0.038425	-0.24
B_ABd	0.072682	**2.21**	0.025353	1.42	0.061606	1.54	-0.044386	-0.90
B_HGd	-0.026097	-0.93	-0.032260	-1.63	-0.059423	-1.65	-0.046162	-1.57
B_AA	0.026985	**2.90**	0.019150	**3.08**	0.045515	**3.59**	0.075155	**5.22**

Among the monetary incentives, only SB consistently exerted a positive, significant effect on applicants' job choices across all quarters. The positive SB coefficient estimates can be interpreted to mean that the incentive was effective in making near term training class seats attractive to applicants. The interaction between SB incentive and senior education status (B_SBSd) is significantly negative for the third quarter, but not significant for the other three quarters. This is not surprising given that seniors generally would not be able to access near term MOS alternatives during the third quarter, which would be around the last three months of the school year (i.e., March, April, and May). The results for the other monetary incentives are mixed. The TOS+EB+ACF (term of service, enlistment bonus, Army College Fund) composite utility (B_lsTEAb) has a positive significant effect in the fourth quarter, a not significant (but somewhat substantial) positive effect in the first quarter, and not significant negative effect in the second and third quarters. The Airborne (AB) incentive (B_ABd) has positive significant effect in the first quarter, not significant but non-negligible effect in the second and third quarter, and not significant negative effect in the fourth quarter. The Hi Grad (HG) incentive (B_HGd) has a substantial but not significant negative effect in the last three quarters. This appears not surprising given that an intended policy goal of the incentive, to make the Army attractive to college individuals, has already taken effect in our recruit data.[5] Because of the likely collinearity among the various incentives offered in a particular training opportunity and the rank of that opportunity on the REQUEST list, it is difficult to separate the effects of these factors on job choices. Nevertheless, the results suggest that incorporating rank into the JCM improves prediction of job choices over what could be obtained by considering incentives alone.

Finally, the applicant's AA scores for MOS alternatives in the job list have a positive significant effect across quarters, demonstrating that applicants tend to choose the MOS training opportunity for which they display the highest AA score. This observation has an important implication for EPAS. It suggests an existing positive person-job-match tendency in REQUEST transactions, which was assumed in the EPAS model to be random. Consequently, for EPAS to have a significant impact on REQUEST, its effect would have to be greater than that needed if the person-job-match were in fact random (i.e., the AA weights were not statistically significantly different from zero).

Off-line Classification System Simulation Process

The simulation process integrated the four components described above. Simulations of the Army recruit-MOS classification process were carried out separately under REQUEST and EER conditions. The simulations were linked by a common sequence of random numbers used by the JCM to select MOS. This section describes the steps in the simulation process. It describes the EER simulation first because the EER uses all aspects of the simulation capability developed for this evaluation. The REQUEST simulation includes a subset of the steps of the EER simulation. Our discussion of this simulation will identify which simulation components are required to simulate classification using REQUEST.

Procedure for the EER Simulation

A single replication in the simulation corresponds to a complete classification of all recruit contracts in the evaluation period under consideration. Starting from the earliest contract in the evaluation period, the simulated recruits were classified into jobs following the order of actual recruit

[5] The HG incentive is given to applicants with more than 30 semester hours of college if they choose an "incentivized" MOS (i.e., these are MOS with EB/ACF incentives). However, because these MOS account for at least 75% of the 101 MOS alternatives considered in the JCM, the incentive effectively functioned in the model as an indicator for college applicants, who tend to be more selective and less likely to access. Thus, the negative HG effect. If we start with the youth population (or market that can be reached by recruiters) in our modeling, then we will be able to see the real impact of this incentive in encouraging youth to *consider and join* the Army, and different results may likely be obtained.

inflow to ensure a realistic distribution of recruit attributes by contract date. The opportunities available to a simulated recruit were derived from the actual opportunities that were presented by REQUEST to that recruit. The opportunities were adjusted for classes that may have filled more quickly in the simulation than in reality and reordered according to the EOG generated by a monthly run of EPAS.

Figure 2 is a diagram of the EPAS-enhanced REQUEST simulation. The simulation uses the results of the operational REQUEST process for FY 2002 and the list of opportunities generated by this process. Thus, the cycle of activities and data in the lower left portion of the figure represent operational data captured from REQUEST. This process is adjusted during the year to reflect the actual contracts signed and additional Army needs. The remainder of the figure describes simulated activities that integrate EPAS optimization with the REQUEST opportunity list. Examination of the process shows that EPAS obtains MOS and training seat vacancy updates (shown on the left side of the figure) from a different source than REQUEST. These two sources are synchronized at the beginning of the simulation, but as the simulation progresses, the simulated fill and available training seats will drift somewhat from the actual values. The adjusted REQUEST MOS-training class list reflects the availability of classes based on the simulated choices of the recruits.

The first step of the simulation process is to initialize the simulation parameters. This step specifies how the simulation will be conducted and sets the initial value for several model parameters. Specifically, initialization includes the following activities.

1. Set the initial conditions for the number of available training seats by MOS and RECSTA month, for the initial fill by MOS and RECSTA month, and for the MOS accession requirements for the fiscal year.

2. Set the random number seed and generate a sequence of random numbers to be used in the simulation. As was stated previously, a common random number sequence was used for both EER and REQUEST simulations.

3. Set the simulation characteristics. Several options for running the simulation are possible. These characteristics include the following categories:
   a. Simulation type, which can be either EER or REQUEST;
   b. The type of SG-MOS connections used by EPAS, which can be the ordinary mean (OM) specified in the EPAS Functional Description, the truncated mean (TM), and a hybrid connection that uses the ordinary mean from the functional description combined with the implementation of cut scores from the revised connections.
   c. JCM type, which can be either the empirical JCM or an ad hoc JCM that chooses an MOS from the five opportunities with the highest rank, with equal probability.

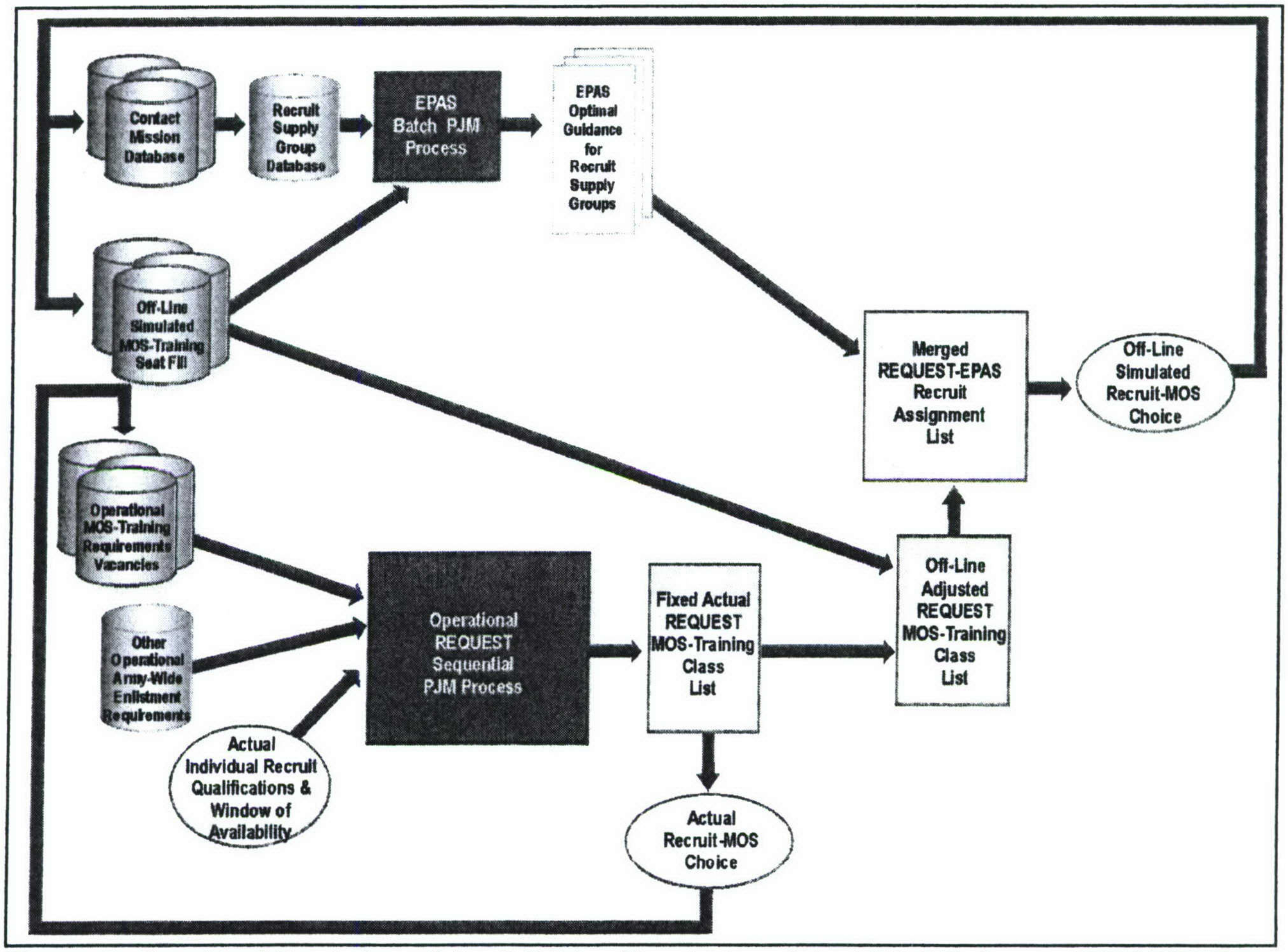

Figure 2. Graphical Depiction of the Off-Line Simulation of the EPAS Enhanced REQUEST Classification System Based on the Fixed Method of Generating the REQUEST List

The second step of the simulation begins with a run of EPAS that produces an optimal assignment and EOG, based on the simulated conditions at the beginning of the month. The EOG is used as the index to reorder the opportunities generated by REQUEST. The simulation then processes data from a single month's applicants to produce a selected MOS and RECSTA date for each applicant. The JCM is used for each applicant to select an opportunity based on its rank order, incentives, and other factors. The simulation adjusts the fill and available training seats to reflect each selected training opportunity. Specifically, processing a month includes the following activities:

1. Run the EPAS optimization based on the values of requirements, fill, and available training seats at the beginning of the month. The optimization allocates SGs to MOS and training start months in the current and immediately following fiscal year. For our simulations, recruits were allocated to FY 2002 and FY 2003.
2. Retrieve the list of training opportunities generated by REQUEST. The availability of MOS training opportunities to individual recruits at the MEPS are generally driven by recruit window of availability and qualifications, USAREC

DEP control tables, YTD fill, MOS priorities, and so forth. REQUEST employs an elaborate procedure for ranking MOS training class dates, incorporating systematic and subjective factors in the process. The final output of this process is a rank ordered list of MOS training class start dates that reflects recruit characteristics and prevailing Army priorities at the time of the MEPS transaction. Recruits with exactly the same characteristics, for example, may obtain different MOS training lists depending on their contract and planned accession dates, real time changes in individual MOS fill rates, and shifts in Army priorities. Because of the complexity of REQUEST, we do not simulate this function. Rather, we use the actual training class opportunities presented to recruits at the MEPS, which are contained in the REQUEST transaction database.

3. Remove opportunities for classes that are filled. Because the training seat availability in the simulation is likely to drift from the corresponding availability using actual assignments, there may be opportunities obtained from REQUEST that are actually closed in the simulation. In this case, they are removed from consideration. It should be noted that filled classes are removed at the beginning of the month, rather than after each assignment. This procedure saves considerable simulation time, and we believe that it is not unrealistic, in that counselors are often able to overfill a class by a small number of individuals.

4. Reorder the opportunity list using the reduced cost measure in the EOG as the index. The opportunities are reordered according to the merge method described previously. Because of the database structure, opportunities for all SGs can be sorted simultaneously. Opportunities from REQUEST that are also included in the EOG are ordered by the reduced cost measure from the EOG. Other opportunities are placed at the end of the list in the same order that they appeared in the REQUEST list.

5. Process each applicant for the month. Each applicant is assigned to the SG that most closely matches his or her demographic information and aptitudes. The JCM is used to assign each applicant to a particular opportunity in the reordered opportunity list. The assignment consists of an MOS and a RECSTA date. The JCM generates a choice probability for each opportunity based on its rank in the list, as well as incentives, and other factors included in the model. The assignment is made using a stochastic procedure incorporating the random number that was generated for that applicant at the beginning of the simulation.

6. Update fill and available training seats based on the opportunity selected. MOS vacancies and class seat fills are updated after classifying each recruit during the evaluation period. The updated class fills are used as input in adjusting the REQUEST list of MOS training opportunities for recruits in subsequent months. The updated class fills at the end of the month are also provided as input to the EPAS optimization routine for the following month. A single classification simulation replication is complete when all recruits with a contract date in the evaluation period under consideration have been classified.

A critical aspect of the simulation design is that the opportunities available to a simulated applicant are based on the actual opportunities presented to that applicant in the REQUEST data.

To the extent to which the EER simulation changes the overall pattern of job assignments through the year compared to the actual REQUEST assignments, the jobs available to the simulated applicant may be considerably different from what would have been generated by REQUEST given the assignments that occurred in the simulation. If the simulated EER assignments are very different from the actual assignments, then a substantial number of classes in the REQUEST opportunity list might be full, and the length of the opportunity list used in the simulation correspondingly reduced. The effect of a reduced list of opportunities would likely be to diminish any improvement in predicted performance brought about by the EER.

However, the effect of differences in the assignment patterns is likely to be minimal, because the simulation includes elements that would reduce such differences over time. First, the EPAS allocation is designed to meet an annual requirement for each MOS. If a particular MOS is under- or over-assigned in a particular month, then the requirement for that MOS used in the EPAS optimization that is conducted at the beginning of the following month will be correspondingly raised or lowered, thus tending to correct any drift between the simulation and actual assignments. In addition, for the two dozen most critical MOS, both REQUEST and EPAS seek to meet the same monthly accession requirements, further minimizing the difference between the two assignments. Consequently, although there is some prospect that the estimated performance of the EER will be reduced due to differences in the opportunity list, the likelihood of a substantial reduction is expected to be minimal.

Procedure for the REQUEST Simulation

Figure 3 depicts the off-line simulation of REQUEST. The operational REQUEST process is represented by the black box in the center of the diagram. As is the case with the EER simulation, the results of the REQUEST simulation may drift away from actual assignments. The amount of the drift is limited by the fact that the JCM is calibrated to produce the overall MOS choice probabilities that match the actual choices of the applicants. A simple adjustment is made to the actual REQUEST list by dropping MOS training classes that are filled at the beginning of a recruit's contract month in the simulation. MOS training opportunities that remain according to the simulated classification process will form the recruit's off-line adjusted REQUEST list, which appears to the right of the fixed actual list.

The upper and lower feedback loops in Figure 3 show how the operational REQUEST data and the results of the simulated recruit MOS choices update the operational and simulated classification systems, respectively. The recruit assignment choice in the simulation is fed back (upper loop) to an off-line database that contains continuously updated MOS and training seat vacancies. These updates are used to adjust the opportunity list. The lower loop indicates that actual recruit choice is fed back into the operational REQUEST system by updating actual MOS and training seat vacancies. The operational updates become REQUEST inputs that impact subsequent opportunity lists.

The process of simulation for the REQUEST condition is the same as that for the EER condition except that the opportunity list produced by REQUEST is not reordered. Consequently, EPAS is never run, no EOG is generated, and the opportunity list is in the same order as was

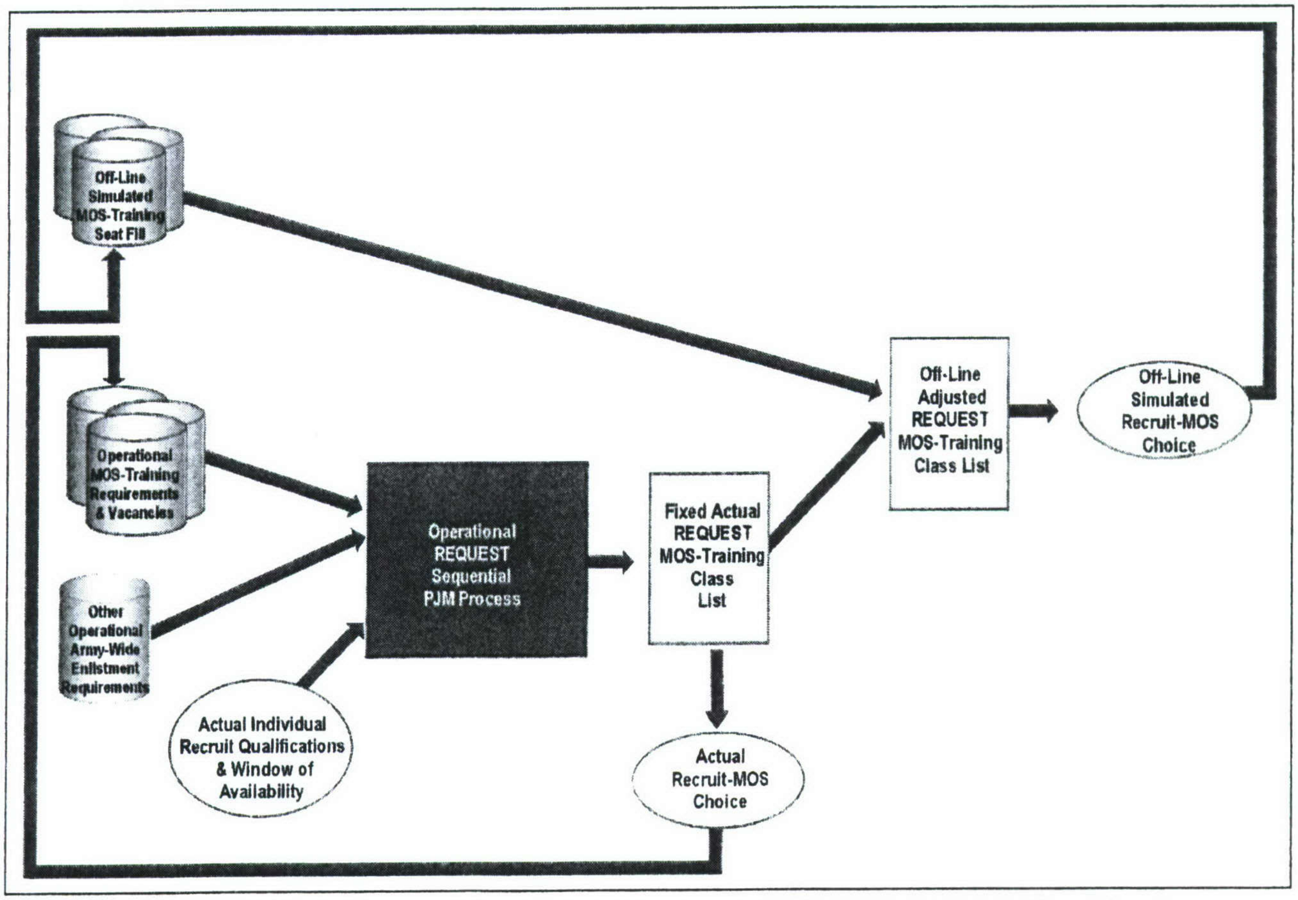

Figure 3. Graphical Depiction of the Off-Line Simulation of the REQUEST Classification System Based on the Fixed Method of Generating the REQUEST List

produced by REQUEST. Other than those differences, the simulation process is the same for REQUEST and EER conditions.

Approach to Analytical Evaluations

Because of the time required to run a complete simulation of the REQUEST or EER system (several hours), it was not efficient to use simulation to evaluate wide ranging changes in merge rules or model assumptions. To facilitate such analyses we used a form of analytical evaluation that approximated the results of a simulation, but did not take into account the fill constraints and training class limits that were considered in the simulation. To conduct these analyses, we summed the probability of a particular MOS selection over the population of applicants. This process produced an expected value for the number of individuals who would be assigned to each MOS. Using this procedure to supplement the simulations allowed us to conduct more exploratory analyses within a limited amount of time. These analytical evaluations were used to examine the effects of counselor performance on the average AA composite score for an assignment.

ANALYSIS AND RESULTS

EPAS Simulation Analysis Indices

We developed three sets of analysis indices for comparing the REQUEST and EER classification systems. The first set of indices summarize important characteristics of applicant job lists that are related to classification efficiency and Army priority MOS. The second set of indices compares the classification efficiency of actual and simulated assignments using the JCM under alternative job list reordering conditions. The third set of indices was developed to conduct follow-up analysis investigating the assignment effects of "counselor performance" and applicant aptitude characteristics. All indices were computed separately by IRB quarter for the overall applicant sample and by applicant subgroups using gender, AFQT category, education status and length of job list. Conceptual and computational descriptions of the indices are presented below.

Job List Analysis

The purpose of this analysis is to evaluate the size and quality of the intersection between the REQUEST list and the EOG. The size of intersection is important because the version of EPAS as tested (i.e., the EER) can only introduce optimization through opportunities common to both the REQUEST list and the EOG of applicants. The quality of intersection will be evaluated by the EOG's potential to *identify* MOS training opportunities that match the aptitude profile of an applicant and *position* them at or near the top of the merged list. Larger and higher quality intersection means greater potential for EPAS classification efficiency. We also used the size of the intersection index to empirically compare the two approaches for constructing the SG-MOS connections, the first using truncated means and the second using ordinary means. Another index was constructed to examine if EPAS' reordering of REQUEST opportunities retains Army priority goals, as indicated by the occurrence and position of critical MOS in the job list.

Size of REQUEST-EOG Intersection. The first index measures the relative size of the REQUEST-EOG intersection (training opportunities common to the REQUEST and EOG lists) average across applicants. For each applicant, the relative size of the intersection was computed as a percentage of the full REQUEST job list. These applicant-level percentages were then averaged across all individuals by subgroups. This index was computed separately for different sets of feasible solutions, using varying optimization levels based on the "value adjustment" of alternate opportunities identified by the EOG of an applicant. The index is computed for the overall IRB sample and by subgroups using:

$$P_{G,L}(v;M) = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \frac{I_i(v;M)}{L_i}$$

The subscript G identifies the following eight applicant subgroups:

- Gender:
  (1) Male; (2) Female
- AFQT category:
  (3) I-IIIA; (4) IIIB and Lower

- Education Status:
  (5) Some College; (6) H.S. Graduate; (7) Senior; (8) Not H.S. Graduate

The subscript L identifies applicant groups by number of opportunities in the job list using four intervals: (a) $L_i = 1$; (b) $2 \le L_i \le 10$; (c) $11 \le L_i \le 30$; and (d) $L_i \ge 31$. The index has two parameters. The value adjustment cut-point v takes values {0, -1, -2, -4, -10, -99}, where 0 identifies EPAS optimal solution and remainder identifies alternate solutions with decreasing optimality. The type of mean used in constructing the SG-MOS connections denoted by M equals TM for truncated mean and OM for ordinary mean. The set $A_{G,L}$ represents applicants that belong to the (G,L) subgroup, with total subgroup size $N_{G,L}$. The numerator inside the summation equals the size of the intersection for the ith applicant, $I_i(v;M) = \sum_{j=1}^{L_i} I_{ij}(v;M)$, where $I_{ij}(v;M)$ is an indicator function that is equal to 1 if the jth opportunity in the REQUEST list is in the intersection and 0 otherwise, and L_i equals total number of opportunities in the list.

Percentage of Priority MOS at the Top. This index compares the occurrences of priority MOS at the "top" of the list under the original REQUEST rank ordering and after EPAS reordering (i.e., EER rank ordering). The "top" of the list was defined for each applicant to be the size of the REQUEST-EOG intersection; that is, the first $I_i(v)$ rank ordered opportunities in the REQUEST or EER lists, using the same set of value adjustment cut-points as in the first index.[6] For each applicant, the percentage of priority MOS that appear in the first $I_i(v)$ rank ordered positions of REQUEST or EER was computed. These individual-level percentages were then averaged across all applicants to obtain the subgroup index. The EPAS reordered list retains the Army priority contained originally in REQUEST if the difference between these indices is not large.

Computationally, the indices are described by the formula below:

$$P_{G,L}^{CM}(v;C) = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \frac{I_i^{CM}(v;C)}{I_i(v)}$$

where C represents classification condition REQUEST or EER; $I_i^{CM}(v;C)$ equals the number of priority MOS among the first $I_i(v)$ opportunities.

Average AA Score of Jobs Included in, Excluded from, and Incrementally Added to the REQUEST-EOG Intersection. Three types of indices based on average AA score were constructed to examine the classification efficiency qualities of EER opportunities. For each applicant and fix value adjustment cut-point v_k, three AA score means were computed using: (a) opportunities included in the REQUEST-EOG intersection; (b) opportunities excluded from the

[6] Note that under the EER rank ordering, the "top" of the list is simply the intersection between REQUEST and EOG corresponding to the value adjustment cut-point v.

intersection; and (c) the opportunities incrementally added to the previous intersection formed using the higher cut-point v_{k-1}. These individual AA score means were then separately averaged across all applicants to form the three types of classification efficiency job list analysis indices.

Computational descriptions of the three indices are as follows. Let Y_{ij} be the AA score of the *i*th applicant corresponding to the *j*th opportunity in his REQUEST list. The first two types of indices are then computed as follows:

$$\overline{Y}^{I}_{G,L}(v) = N^{-1}_{G,L} \sum_{i \in A_{G,L}} \overline{Y}^{I}_{i}(v)$$

$$\overline{Y}^{E}_{G,L}(v) = N^{-1}_{G,L} \sum_{i \in A_{G,L}} \overline{Y}^{E}_{i}(v)$$

where $\overline{Y}^{I}_{G,L}(v)$ is the average of AA score means of opportunities in the REQUEST-EOG intersection and $\overline{Y}^{E}_{G,L}(v)$ is the average of AA score means of opportunities excluded from the intersection, each average taken across applicants in the (G,L) subgroup. The expressions inside the summation are the applicant level AA score means:

$$\overline{Y}^{I}_{i}(v) = \frac{\sum_{j=1}^{I_i(v)} Y_{ie_j}}{I_i(v)} \; ; \; \overline{Y}^{E}_{i}(v) = \frac{\sum_{j=I_i(v)+1}^{L_i} Y_{ie_j}}{L_i - I_i(v)}$$

where e_j is the position of the *j*th REQUEST opportunity in the EER list of the *i*th applicant.[7] The third type of index is computed for value adjustment cut-point v_k as:

$$\overline{Y}^{A}_{G,L}(v_k) = N^{-1}_{G,L} \sum_{i \in A_{G,L}} \overline{Y}^{A}_{i}(v_k)$$

where the applicant level (incremental) AA score mean equals

$$\overline{Y}^{A}_{i}(v_k) = \frac{\sum_{j=I_i(v_{k-1})+1}^{I_i(v_k)} Y_{ie_j}}{I_i(v_k) - I_i(v_{k-1})}$$

The manner in which EPAS reorders REQUEST opportunities is classification optimal if it produces indices related by $\overline{Y}^{I}_{G,L}(v) \geq \overline{Y}^{A}_{G,L}(v) \geq \overline{Y}^{E}_{G,L}(v)$ for all values of v. The difference between $\overline{Y}^{I}_{G,L}(v)$ and $\overline{Y}^{E}_{G,L}(v)$ must be larger for higher values of v (i.e., more optimal cut-point),

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[7] While it is more accurate to express the EER rank order using e_{ij} to stress that it is specific to the *i*th applicant, we drop the index *i* for brevity.

while the incremental mean $\overline{Y}^{A}_{G,L}(v)$ must decrease with v. This is because the quality of jobs remaining in the excluded set would go down as the more optimal jobs are included in the EOG.

MPP Classification Efficiency Analysis

The next set of indices compares the classification efficiency of actual assignments and computer simulated assignments based on the JCM of applicants under different job list reordering conditions. Two kinds of indices are employed in these analyses. The first type is composed of averages of predicted performance based on the AA scores corresponding to the MOS assigned to applicants under different classification conditions. The second type is composed of different lower and upper bounds for the average predicted performance indices. These bounds are useful in evaluating improvements in predicted performance compared to random assignment and in assessing how much more efficiency can be achieved by subgroups.

Average AA Score of MOS Assignments. Four indices were computed, each representing the average AA score of MOS assignments for one of the following four classification conditions: (a) actual REQUEST assignments; (b) simulated REQUEST assignments; (c) EER assignments; and (d) EER assignments using an alternative merge rule. The average AA score for conditions (b) to (d) are based on simulated MOS assignments of applicants using the JCM. For the EPAS-enhanced conditions (c) and (d), the indices were computed using EOG with cut-point v equal to -99. The subscripts used to label these conditions in the expression below are, respectively, AR, SR, ER1, and ER2.

Again, let Y_{ij} be the AA score of the ith applicant corresponding to the jth opportunity in his / her REQUEST list. Denote the REQUEST rank order of the opportunity assigned to the ith applicant under the four conditions by J_{AR}, J_{SR}, J_{ER1}, and J_{ER2}. Then the AA score averages for the (G,L) subgroup under the four conditions are simply

$$\overline{Y}^{AR}_{G,L} = N^{-1}_{G,L} \sum_{i \in A_{G,L}} Y_{iJ_{AR}}$$

$$\overline{Y}^{SR}_{G,L} = N^{-1}_{G,L} \sum_{i \in A_{G,L}} Y_{iJ_{SR}}$$

$$\overline{Y}^{ER1}_{G,L} = N^{-1}_{G,L} \sum_{i \in A_{G,L}} Y_{iJ_{ER1}}$$

$$\overline{Y}^{ER2}_{G,L} = N^{-1}_{G,L} \sum_{i \in A_{G,L}} Y_{iJ_{ER2}}$$

Lower and Upper Bounds of AA Score Averages. Four indices were constructed representing the minimum and maximum of AA score average under "unrestricted" and "restricted" computing conditions. In the unrestricted condition, the mean and maximum scores of each applicant were computed from the full vector of nine AA scores. In the restricted condition, mean and maximum scores were computed using only the subvector of AA scores corresponding to MOS included in the REQUEST list of each applicant. These four values were then averaged separately across applicants by subgroup to obtain: (a) *unrestricted average mean* AA score; (b) *unrestricted average maximum* AA score; (c) *restricted average minimum* AA score; and (d) *restricted average maximum* AA score.

Let $(X_{i1},\ldots,X_{9_i})$ equal the full vector of nine AA scores and $(Y_{i1},\ldots,Y_{iL_i})$ the vector of AA scores corresponding to MOS in the REQUEST list of the *i*th applicant. Then these bounds are described computationally by:

$$\overline{Y}_{G,L}^{\text{meanU}} = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \text{mean}(X_{i1},\ldots,X_{i9_i})$$

$$\overline{Y}_{G,L}^{\text{maxU}} = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \max(X_{i1},\ldots,X_{i9_i})$$

$$\overline{Y}_{G,L}^{\text{meanR}} = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \text{mean}(Y_{i1},\ldots,Y_{iL_i})$$

$$\overline{Y}_{G,L}^{\text{maxR}} = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \max(Y_{i1},\ldots,Y_{iL_i})$$

These four bounds are strictly related as follows $\overline{Y}_{G,L}^{\text{meanU}} \le \overline{Y}_{G,L}^{\text{meanR}} \le \overline{Y}_{G,L}^{\text{maxR}} \le \overline{Y}_{G,L}^{\text{maxU}}$. The unrestricted average mean score $\overline{Y}_{G,L}^{\text{meanU}}$ corresponds to the MPP of the subgroup if the accession cohort is *randomly* classified to jobs without regard for aptitude profiles of individuals. It only represents selection effects of the REQUEST system prior to the effects of cut scores. On the other hand, the restricted average mean score $\overline{Y}_{G,L}^{\text{meanR}}$ corresponds to the MPP of the subgroup if the accession cohort is randomly classified to jobs for which they qualify. The difference $\left(\overline{Y}_{G,L}^{\text{meanR}} - \overline{Y}_{G,L}^{\text{meanU}}\right)$ accounts for the classification efficiency built in the REQUEST system through cut scores.

Analysis Investigating Counselor Performance and AA Assignment Effects

The third set of analysis indices investigates the impact of "counselor performance" and aptitude characteristics on average predicted performance of applicants. In this analysis the JCM probabilities are used to "proportionately assign" an applicant to all MOS in his job list. This analytic simulation approach is approximately equivalent to the full computer simulation used in the MPP analysis above.[8] At the core of this analysis are two types of modifications to the JCM. In the first modification the weights of the rank of MOS opportunities were adjusted to reflect better performing counselors. In the second modification the contribution of AA scores in the utility/attractiveness equations was eliminated from the JCM. We also introduced a third job list rank order condition based on the AA scores of applicants, in addition to the REQUEST and EER conditions. These modifications to the JCM are outlined below.

[8] In the traditional simulation, applicants are assigned individually to jobs, while in the analytic simulation, fractional applicants are assigned to jobs according to their choice probabilities. In addition, the analytic simulation does not consider constraints, such as requirements and available seats.

Constructing Higher Counselor Performance. Potential classification efficiency from EPAS is linked to how well counselors can convince applicants to take MOS at or near the top of the job list. The following modification to the JCM increases the effect of the rank order of an MOS by positively shifting counselor performance. We begin by reviewing the rank order-related component of utility. The contribution of rank order to the utility of the *j*th opportunity in the job list of the *i*th applicant is

$$B_{Rnk,C_i} X_{Rnk,j} = (B_{Rnk} + B_C C_i) X_{Rnk,j}$$

That is, the weight of rank for the *i*th applicant is the sum of a constant B_{Rnk} that is common to all applicants and a term that contains the performance C_i of the counselor that he faced. In the JCM specification, C_i equals the 60th percentile of the overall ranks of MOS in reservations made by all applicants processed by the counselor during an estimation period. Lower C_i values correspond to better counselor performance. Negative estimates of B_{Rnk} and positive estimates of B_C produce a combined rank weight $(B_{Rnk} + B_C C_i)$ that becomes more negative the higher the counselor's performance. In turn, the combined rank weight yields higher partial utility for opportunities at the top of the list (lower $X_{Rnk,j}$ values) compared to opportunities at the bottom of the list (higher $X_{Rnk,j}$ values). For low performing counselors, the combined rank weight $(B_{Rnk} + B_C C_i)$ becomes less negative or even positive and, in turn, produces rank-related utility for opportunities at the top of the list that are not very different compared to, and can even be lower than, opportunities at the bottom of the list.

We constructed two sets of rank weights representing higher counselor performance, based on the 50th and 40th percentiles of the ranks of MOS reservations processed by each counselor. Label these percentiles as C_i^{50} and C_i^{40} and, for consistency, re-label C_i by C_i^{60}. Also denote the corresponding rank weights by B_{Rnk,C_i}^{60}, B_{Rnk,C_i}^{50}, and B_{Rnk,C_i}^{40}. To obtain rank weights corresponding to C_i^{50} and C_i^{40}, we can simply use $B_{Rnk,C_i}^{50} = (B_{Rnk} + B_C C_i^{50})$ and $B_{Rnk,C_i}^{40} = (B_{Rnk} + B_C C_i^{40})$. Instead of this direct approach, we approximated each rank weight as a linear function of B_{Rnk,C_i}^{60}. This strategy was employed to avoid rebuilding the auxiliary table, which already contains B_{Rnk,C_i}^{60} and on which all our analysis routines were based. In sum, two sets of rank weights representing higher counselor performance were computed using

$$B_{Rnk,C_i}^{50} = A^{50} + B^{50} \times B_{Rnk,C_i}^{60}$$
$$B_{Rnk,C_i}^{40} = A^{40} + B^{40} \times B_{Rnk,C_i}^{60}$$

The constants $\{A^{50}, A^{40}, B^{50}, B^{40}\}$ were obtained by separately regressing C_i^{50} and C_i^{40} on C_i^{60} using counselor performance data across all applicants.

JCM without AA Effect. Results of the JCM estimation showed that applicants tend to go to jobs where they have high AA scores. This finding represents an extant positive person-job match tendency in the REQUEST system. EPAS must therefore produce classification gains over and above the existing person-job match in REQUEST to show classification improvements. The second modification to the JCM excluded the contribution of AA scores in the computation of utilities of applicants. This modification effectively examines EPAS classification gains in the absence of a positive AA effect. While it is unrealistic to ignore the contribution of AA in the JCM, from a practical standpoint this analysis in a way examines if EPAS can benefit those applicants who tend not to choose according to aptitude profile.

To implement this modification we simply subtracted $B_{AA}X_{AA,j}$, the contribution of AA score in the utility of the *j*th MOS, from the pre-computed "fixed" utility component in the auxiliary table (i.e., $S_F(i,m,d)$) that does not depend on rank order. Computation of choice probabilities then proceeded as before using the adjusted fixed component and the rank based component of utility.

AA Rank Ordering. Lastly we also introduced a third rank ordering condition based on the AA scores of applicants. This condition simply reordered opportunities in the job list in descending order of the respective AA scores, with ties resolved using the reception date of the training opportunity. This condition produces the most classification efficient rank ordering of jobs in the REQUEST list. It is more classification efficient than EPAS rank ordering, which includes additional criteria (e.g. Army priority) that may put a job (e.g. MOS 11X) for which an applicant has a low AA score at the top of the list. We will use "RAA" to label results based on AA rank ordering.

Altogether there are a total of 18 analytic simulation conditions formed from three factors:

- Counselor performance (3 levels): C_i^{60}, C_i^{50} and C_i^{40};
- AA Effect Status (2 levels): With AA, Without AA;
- Rank Order (3 levels): REQUEST, EER, RAA

The analytically simulated MPP produced by these 18 conditions is described computationally by:

$$\overline{Y}_{G,L}^{R,C,A} = N_{G,L}^{-1} \sum_{i \in A_{G,L}} \sum_{j} Y_{ij} P_i(j \mid R,C,A)$$

where the index *R* represents the rank order factor (REQUEST, EER, or RAA), *C* represents counselor performance level (C_i^{60}, C_i^{50} or C_i^{40}), and *A* represents status of the AA effect in the JCM (with or without AA). The right-hand-side of the equation shows that weighted means of AA scores are computed by applicants, which in turn are averaged across all applicants in the subgroup. The weights of the AA scores are the corresponding choice probabilities of applicants under the condition specified by factor/index (*R*,*C*,*A*). In other words, the analytic simulations used JCM probabilities to proportionately assign each applicant to all opportunities in his job list.

Size of REQUEST-EOG Intersection

We first examined the extent to which the EOG and the list of opportunities produced by REQUEST share common opportunities. Table 5 shows the percentage of opportunities in the REQUEST list that were also included in the EOG, as a function of IRB quarter, applicant subgroup, type of SG-MOS connection, and reduced cost limit. In all cases, the percentage overlap increased substantially as the absolute value of the reduced cost limit increased from zero, which only included optimal solutions in the EOG, to -99, which included nearly all reduced-cost solutions. For the entire fiscal year of the analysis, overlap varied from 0.8% to 81.9% when the TM was used for the SG-MOS connections, and from 1.3% to 63.9% when the OM was used. The OM produced greater overlap for more stringent values of the reduced-cost limit (i.e., lower in absolute value), while the TM produced greater overlap at more lenient values of the reduced-cost limit.

Table 5. Size of REQUEST-EOG Intersection as Percentage of the REQUEST List by Type of SG-MOS Connection (TM=Truncated Mean, OM=Ordinary Mean), Subgroup, and Limit Value for Full FY and by IRB Quarter.

		IRB Quarter									
		All Qrt.		Q1		Q2		Q3		Q4	
Subgroup	**Limit**	**TM**	**OM**	**TM**	**OM**	**TM**	**OM**	**TM**	**OM**	**TM**	**OM**
Overall	-99	81.9	63.9	85.4	67.9	85.2	65.4	85.4	64.8	75.6	60.3
	-10	75.7	62.6	77.7	64.6	79.1	64.3	78.2	63.9	70.5	59.5
	-4	42.3	50.1	45.6	51.4	44.7	53.1	41.8	52.8	39.7	45.4
	-2	21.3	30.3	25.4	32.1	22.8	34.1	21.4	32.9	18.5	24.9
	-1	10.0	16.7	11.6	17.8	10.4	19.1	9.6	19.0	9.4	12.9
	0	0.8	1.3	1.5	1.6	1.1	1.7	0.6	1.4	0.5	0.6
Male	-99	84.6	69.1	86.3	71.8	86.1	70.5	87.3	69.3	80.7	66.7
	-10	79.8	68.3	80.4	69.4	81.3	69.8	81.8	68.9	77.0	66.3
	-4	47.0	56.4	50.0	57.0	48.5	59.2	46.3	58.6	45.0	52.4
	-2	24.6	34.4	28.5	36.3	25.8	38.3	25.2	36.5	21.6	29.1
	-1	11.8	19.1	13.4	20.3	12.3	21.5	11.6	21.4	11.0	15.2
	0	0.9	1.4	1.8	1.7	1.3	1.9	0.7	1.6	0.5	0.7
Female	-99	71.9	44.3	81.6	51.6	81.4	45.7	78.1	47.8	58.2	38.3
	-10	60.1	41.2	66.4	44.1	70.5	42.8	64.7	45.2	48.2	36.4
	-4	25.1	26.6	26.8	27.6	30.0	29.5	25.2	31.1	21.3	21.2
	-2	8.9	15.1	12.1	14.1	10.8	17.5	7.5	19.8	7.6	10.6
	-1	3.2	7.7	4.0	7.3	3.1	9.6	2.1	10.0	3.7	4.9
	0	0.3	0.8	0.2	1.0	0.2	1.2	0.4	1.0	0.4	0.5
I-IIIA	-99	84.8	76.9	86.0	78.6	85.3	78.0	87.9	78.8	81.7	74.0
	-10	81.0	75.4	80.8	75.3	81.9	76.6	84.1	77.6	78.4	72.9
	-4	55.0	59.3	53.2	60.1	56.5	62.7	56.6	62.4	53.6	54.4
	-2	28.9	35.3	30.1	37.5	30.4	39.6	30.7	37.8	25.9	29.5
	-1	13.7	19.7	14.3	21.2	14.2	22.0	13.8	21.8	13.0	15.9
	0	1.1	1.1	1.9	1.4	1.5	1.4	0.8	1.3	0.6	0.5
IIIB	-99	82.8	37.6	91.3	44.9	93.2	40.3	90.7	39.8	67.3	31.5
	-10	70.6	36.8	75.9	40.8	80.7	39.8	76.0	39.5	58.4	31.4
	-4	15.9	31.6	28.9	32.1	19.9	34.2	14.0	36.0	10.1	26.5
	-2	5.1	20.5	14.5	20.6	6.1	24.1	3.5	25.0	2.4	14.8
	-1	2.1	10.4	5.0	10.5	2.1	13.5	1.7	13.4	1.5	6.3
	0	0.2	1.8	0.3	2.4	0.2	2.7	0.2	1.9	0.2	0.9
IV	-99	31.3	19.9	47.4	16.5	36.9	16.3	28.9	23.2	18.9	20.9
	-10	22.4	19.6	38.6	15.3	28.2	16.1	20.4	23.2	9.1	20.9
	-4	5.6	18.4	8.3	11.5	6.7	15.5	6.4	22.9	1.7	19.5
	-2	1.5	11.3	5.2	4.3	1.5	7.6	0.7	14.6	0.1	14.7

Table 5. Size of REQUEST-EOG Intersection as Percentage of the REQUEST List by Type of SG-MOS Connection (TM=Truncated Mean, OM=Ordinary Mean), Subgroup, and Limit Value for Full FY and by IRB Quarter.

	-1	0.6	7.9	2.3	2.6	0.7	5.7	0.0	13.3	0.1	6.1
	0	0.1	1.0	0.2	0.5	0.2	1.2	0.0	1.3	0.0	0.8
HSDG	-99	87.4	64.2	90.8	68.1	90.7	65.2	90.4	63.5	81.8	62.3
	-10	79.3	62.8	80.4	63.6	82.7	64.0	81.9	62.7	74.8	61.7
	-4	42.3	49.6	44.0	49.8	44.1	52.0	42.5	50.6	40.3	47.1
	-2	20.2	28.7	22.9	30.4	21.3	32.7	21.8	31.0	17.1	23.7
	-1	8.7	14.9	9.4	15.9	8.8	16.6	8.8	16.1	8.2	12.6
	0	0.8	1.3	1.5	1.7	1.1	1.7	0.7	1.6	0.4	0.6
Senior	-99	72.2	60.3	75.8	62.4	77.0	63.1	80.4	68.9	63.7	53.1
	-10	68.4	58.8	70.0	61.2	73.5	61.7	75.0	66.9	61.4	51.7
	-4	37.4	45.8	40.7	47.1	40.0	49.1	37.5	54.4	34.9	38.6
	-2	20.2	28.7	24.2	30.6	22.2	34.0	19.9	36.1	18.0	21.1
	-1	9.6	15.6	12.1	16.9	9.7	19.4	9.1	21.5	9.2	9.9
	0	0.8	0.8	1.3	1.1	0.6	0.8	0.7	0.6	0.8	0.8
Non-Grad	-99	77.6	66.6	79.6	71.8	78.7	67.9	79.2	64.2	72.9	64.9
	-10	73.6	65.9	76.9	69.7	75.2	67.4	73.4	63.8	69.9	64.6
	-4	47.5	55.9	53.1	58.7	50.3	59.5	43.9	55.9	45.3	50.5
	-2	25.6	36.1	32.3	37.4	26.8	37.7	22.0	34.4	24.6	35.8
	-1	14.0	22.5	16.4	23.4	15.1	24.8	11.7	22.7	14.1	19.2
	0	0.7	1.7	1.6	1.8	1.3	2.8	0.4	1.8	0.1	0.3

The degree of overlap varied both by quarter and by demographic category. The differences among the four quarters of the simulation were not great; with the fourth quarter showing lower overlap than the other quarters for both OM and TM connections and at all levels of the reduced-cost limit. Overlap was substantially lower for females than for males (also see Figure 4), and was lower for applicants in AFQT Categories IIIB and IV than for those in Categories I-IIIA (also see Figure 5).[9] The difference between the OM and TM was especially great for applicants in AFQT Category IIIB, in which the TM solution produced a maximum overlap of 82.8%, while the OM solution produced a maximum overlap of 37.6%. Finally, differences between educational groups were minor, with seniors showing somewhat lower overlap between the REQUEST list and the EOG than either high school graduates or non-graduates. Since EPAS assumes that all seniors graduate in the spring of the year, the opportunities in the EOG may not match the REQUEST opportunities for those seniors who graduate at some other time of the year (e.g., December).

Figure 6 shows the overlap between the opportunities produced by REQUEST and EPAS as a function of type of SG-MOS connection, reduced-cost limit, IRB quarter, and number of opportunities generated by REQUEST. The figure excludes applicants who received a single opportunity, who represent approximately 20% of all applicants. The overall pattern of results reflects the larger overlap associated with the TM for more lenient values of the reduced-cost limit and the lower overlap associated with the TM for more stringent values. Examination of Figure 6 shows that the advantage of the TM was larger when the number of alternatives was smaller. It was greatest when the REQUEST list contained fewer than 10 alternatives, as shown in the second column of the figure, while the difference was much smaller when there were 31 or more alternatives.

[9] Within the near-optimal range on the limit value, the percentage overlap difference between high and low quality categories reflects that REQUEST screens offer less variety to lower quality applicants, and that EPAS finds greater potential classification efficiency among high quality applicants (Legree, et al., 1996).

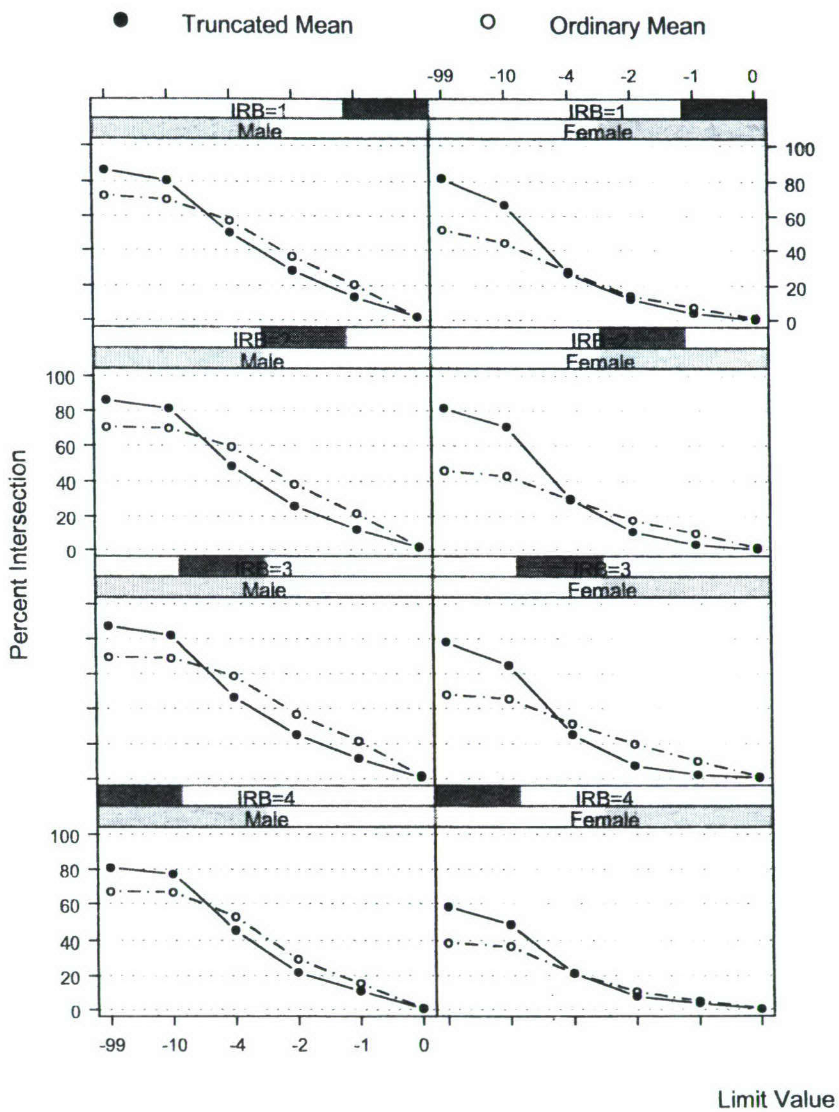

Figure 4. Plot comparing Percent Size of Intersection Between Type of SG-MOS Connection by IRB Quarter and Gender

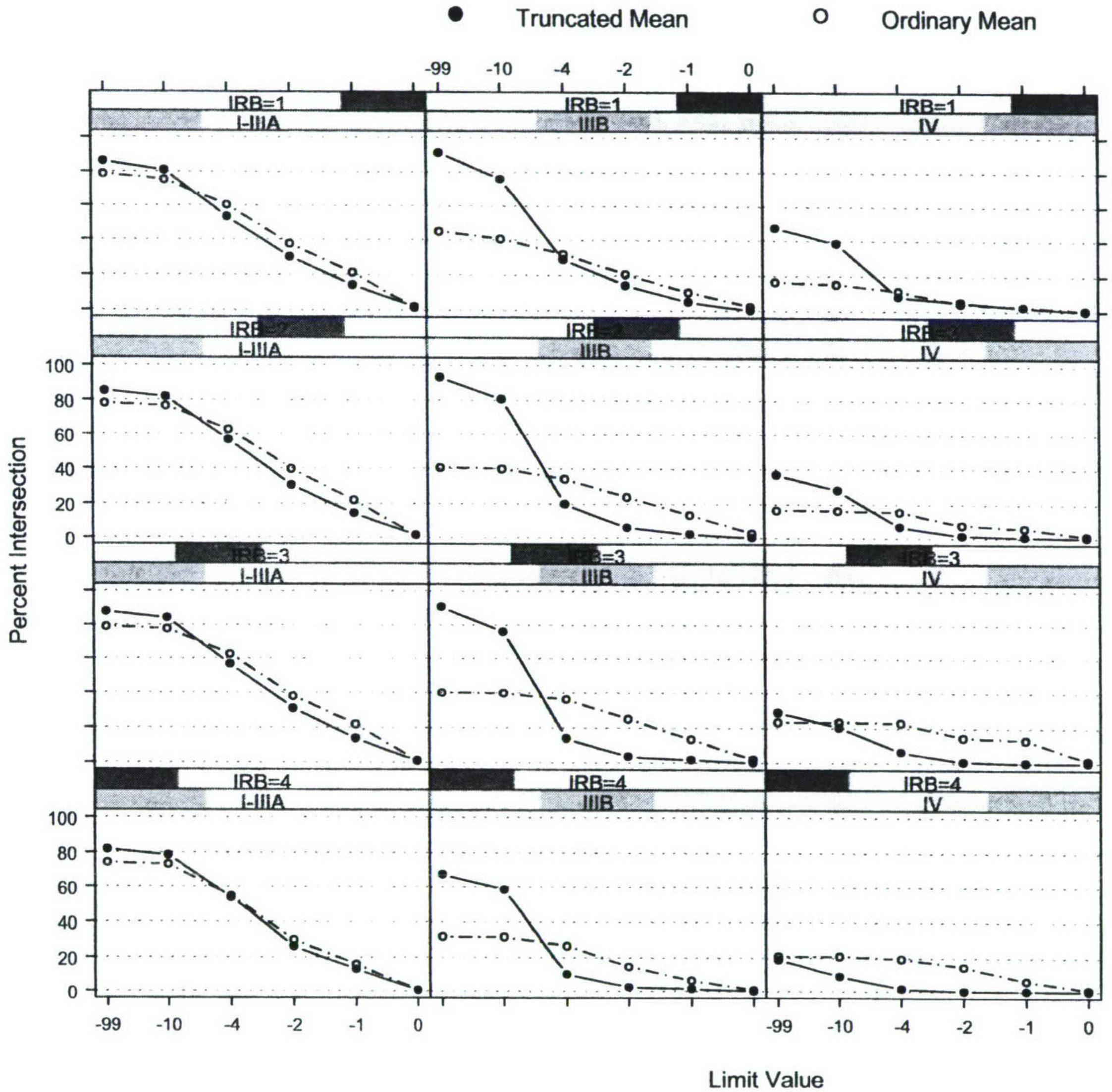

Figure 5. Plot comparing Percent Size of Intersection Between Type of SG-MOS Connection by IRB Quarter and AFQT Category

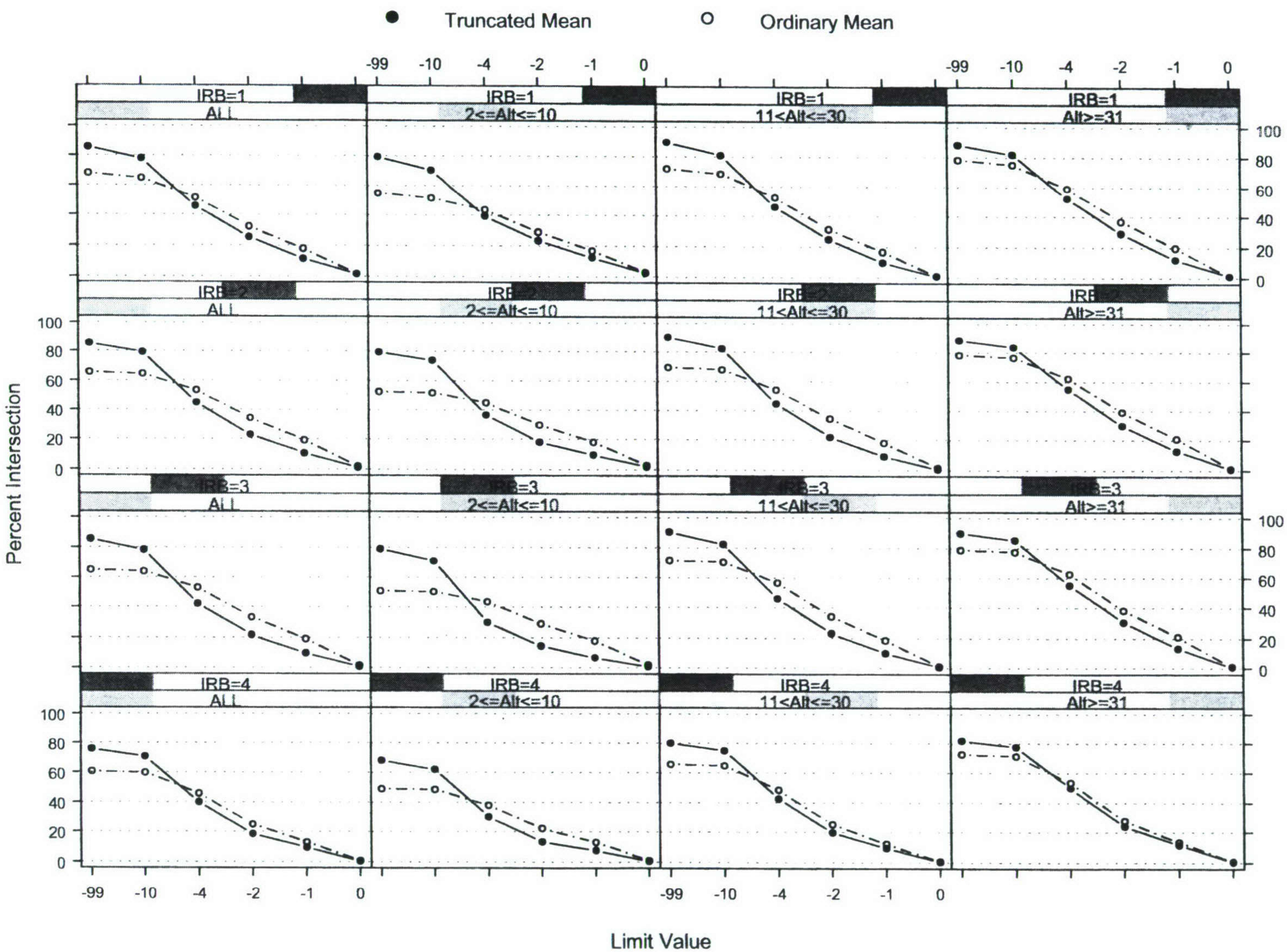

Figure 6. Plot comparing Percent Size of Intersection Between Type of SG-MOS Connection by IRB Quarter and Number of Opportunities

In summary, a suitably lenient value for the reduced-cost limit produced substantial overlap between the opportunity lists produced by REQUEST and EPAS. This level of overlap should be sufficient to support improved predicted performance by reordering the opportunity list. At these lenient values of the reduced-cost limit, the revised SG-MOS connections based on the truncated mean produced greater overlap than was produced by the earlier method based on the ordinary mean. The advantage of the TM was greater for women, for lower-aptitude applicants, and for applicants who received a relatively short list of available opportunities.

Percentage of Priority MOS at the Top

One concern about methods to reorder the list of opportunities produced by REQUEST is that priority MOS will be moved from their prominent location near the top of the REQUEST list to a lower position in the EER list. To test this hypothesis, we calculated the percentage of priority MOS in the intersection between the REQUEST and EOG lists for each applicant. The intersection represents the top of the EER list. We then calculated a similar percentage for a segment with the same number of opportunities at the top of the REQUEST list. The values of these indices are shown along with the average size of the intersection in Table 6, by number of opportunities in the job list, reduced-cost limit, and IRB quarter.

Table 6. Mean Percent of Priority MOS at the Top of REQUEST (REQ) and EER Job Lists Relative to Size of Intersection by Number of Opportunities in the Job List, Limit Value, and IRB.

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
IRB Qrt.	**Limit**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**
ALL	-99	16.9	53	50	0.8	56.0	56.0	3.6	56.0	54.0	20.5	48.4	45.2	36.2	54.6	50.1
	-10	15.8	55	51	0.7	57	57	3.2	58	55	19.0	52	46	34.3	57	51
	-4	9.6	70	58	0.4	60	60	1.5	66	58	11.0	71	55	22.2	75	60
	-2	4.9	81	65	0.2	66	66	0.7	72	64	5.5	82	63	11.8	85	67
	-1	2.2	85	69	0.1	73	73	0.4	77	70	2.4	86	68	5.3	88	71
	0	0.1	97	93	0.0	94	94	0.0	82	82	0.1	97	92	0.3	98	95
Q1	-99	18.3	53	49	0.8	56	56	3.7	55	53	21.9	49	45	36.6	55	48
	-10	16.8	56	50	0.8	57	57	3.2	58	54	19.9	54	46	34.0	58	49
	-4	10.3	74	57	0.4	69	69	1.6	70	61	11.8	74	53	21.7	79	57
	-2	5.7	86	61	0.2	73	73	1.0	76	66	6.5	87	59	12.1	90	62
	-1	2.4	90	64	0.1	78	78	0.5	81	70	2.6	92	62	5.1	92	64
	0	0.2	99	95	0.0	100	100	0.1	99	98	0.2	99	94	0.5	99	96
Q2	-99	18.3	56	53	0.8	55	55	3.7	61	59	21.6	52	48	37.3	58	52
	-10	17.1	58	53	0.7	55	55	3.3	62	59	20.0	55	49	35.4	61	53
	-4	10.5	72	57	0.4	60	60	1.5	69	61	11.5	72	54	23.3	77	59
	-2	5.5	83	65	0.2	68	68	0.7	75	69	5.7	84	63	12.7	87	65
	-1	2.3	85	68	0.1	72	72	0.4	79	73	2.3	86	66	5.5	87	68
	0	0.2	98	93	0.0	94	94	0.1	97	98	0.1	99	91	0.3	98	93
Q3	-99	16.9	55	51	0.8	58	58	3.9	57	54	20.4	52	48	38.4	56	50
	-10	15.8	58	52	0.7	59	59	3.5	60	55	18.7	56	49	36.5	58	51
	-4	9.5	72	56	0.4	59	59	1.4	70	60	10.9	74	54	23.7	74	56
	-2	5.1	81	61	0.2	67	67	0.7	78	65	5.6	82	59	13.1	83	61
	-1	2.2	84	67	0.1	76	76	0.3	83	73	2.5	85	65	5.8	85	68
	0	0.1	97	94	0.0	100	100	0.0	95	89	0.1	96	93	0.3	98	95
Q4	-99	15.4	48	47	0.7	55	55	3.3	52	51	19.3	43	42	33.5	50	49
	-10	14.5	50	48	0.7	56	56	2.9	54	51	18.1	46	44	31.8	52	51
	-4	8.8	66	59	0.4	58	58	1.4	59	54	10.5	66	58	20.5	71	66
	-2	4.2	78	69	0.2	61	61	0.6	65	60	4.9	79	67	10.0	84	75
	-1	2.0	84	75	0.1	69	69	0.3	70	67	2.4	85	73	4.8	89	80
	0	0.1	94	91	0.0	86	86	0.0	55	61	0.1	96	92	0.2	98	96

As the table indicates, when the reduced-cost limit was -99, priority MOS were only slightly less likely to be included in the top of the EER list than they were at the top of the REQUEST list. Overall, 53% of opportunities at the top of the REQUEST list represented priority MOS, while 50% of opportunities at the top of the EER list did. As the reduced-cost limit became more stringent, the difference between the REQUEST and EER lists increased. However, when the limit was zero, the difference was negligible, as it was for applicants who were given a single opportunity. This anomaly occurred because of the small average size of the intersection for these conditions, and the correspondingly high likelihood that the intersection between the REQUEST and EER lists was empty. Since the index was not defined when the intersection is empty, these cases were treated as missing and did not go into the calculation of the index.

Differences between the REQUEST and EER lists in inclusion of priority jobs varied as a function of the number of opportunities presented to the applicant and of IRB quarter. Applicants from the fourth quarter were presented a smaller percentage of priority jobs than those in other quarters. The difference in the value of the index between the REQUEST and EER lists was also lowest in the fourth quarter. In addition that difference increased as the number of opportunities presented to the applicant increased. Nevertheless, for applicants who were given 31 or more opportunities, the difference over all quarters was a relatively modest 4.5% at the most lenient reduced-cost limit. For these applicants, an average of 18.1 opportunities in the intersection between the REQUEST list and the EOG represented priority MOS, while an average of 19.8 opportunities at the top of the unordered REQUEST list represented priority MOS.

Average AA Score as a Function of size of the REQUEST-EOG Intersection

As the reduced-cost limit becomes more lenient, more opportunities are included in the EOG for each supply group, but these opportunities are increasingly further from optimal and tend to have lower AA scores. At some point the opportunities newly added to the EOG may have AA scores that are sufficiently low to reduce the total predicted performance. Consequently, as the reduced-cost limit is made more lenient, both the average AA of the opportunities that are added and the overall average of all opportunities included in the intersection tend to decrease, while the average AA of opportunities that are not included in the intersection tends to increase. Figure 7 plots the mean AA score of included, excluded, and additional opportunities as a function of the reduced-cost limit, number of opportunities, and applicant gender. Figure 8 provides a similar set of plots as a function of applicant aptitude groups. In both figures, applicants who received a single opportunity are not shown.

As expected, the average AA score of added opportunities decreased from 115.2 to 103.6, as the reduced-cost limit was relaxed from 0 to -99. The average AA score of all opportunities included in the intersection also decreased to a somewhat higher level (106.4 vs. 103.6). Overall, the decline in average AA score of the opportunities included in the REQUEST-EOG intersection was greater when there were between 2 and 10 opportunities (8.5 points) than when there were 31 or more opportunities (5.4 points). Examination of Figure 7 reveals that the decline for females (7.9 points) is nearly the same as that for males (7.8 points). Figure 8 shows a similar relationship with regard to aptitude. Relaxing the reduced-cost limit produced a greater decline in

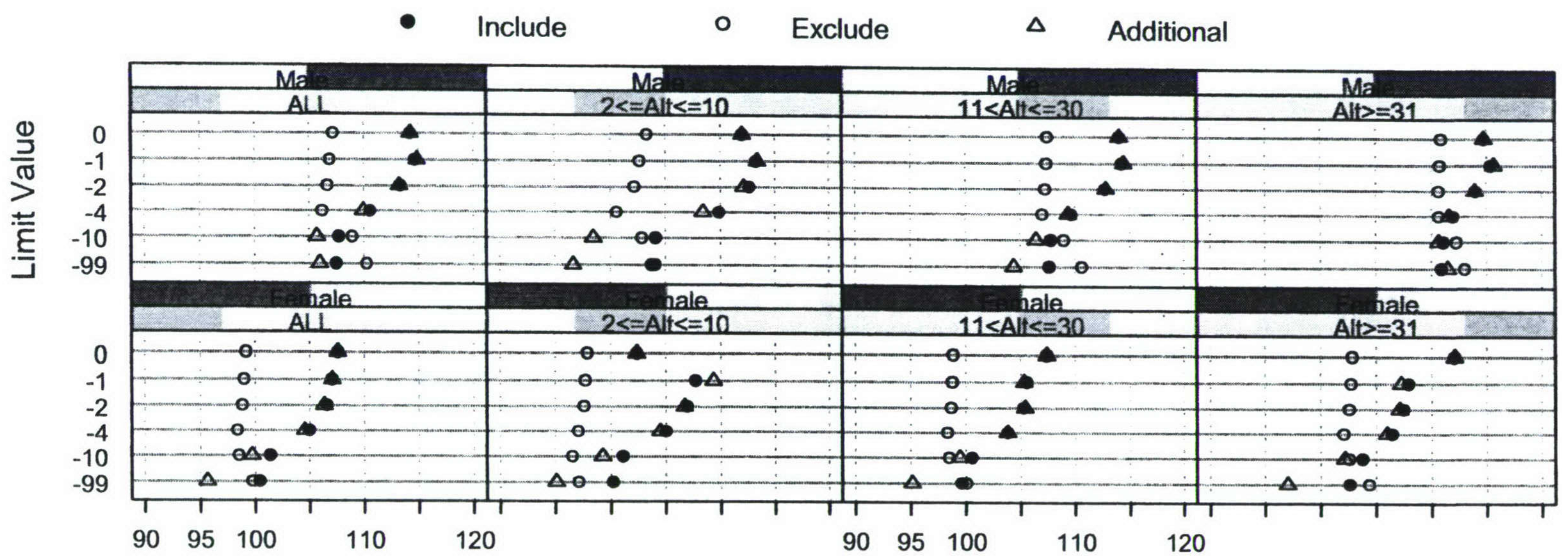

Figure 7. Plot of Mean AA Score of Included, Excluded, and Additional Opportunities in Intersection for All IRB Quarters Combined by Gender and Number of Opportunities.

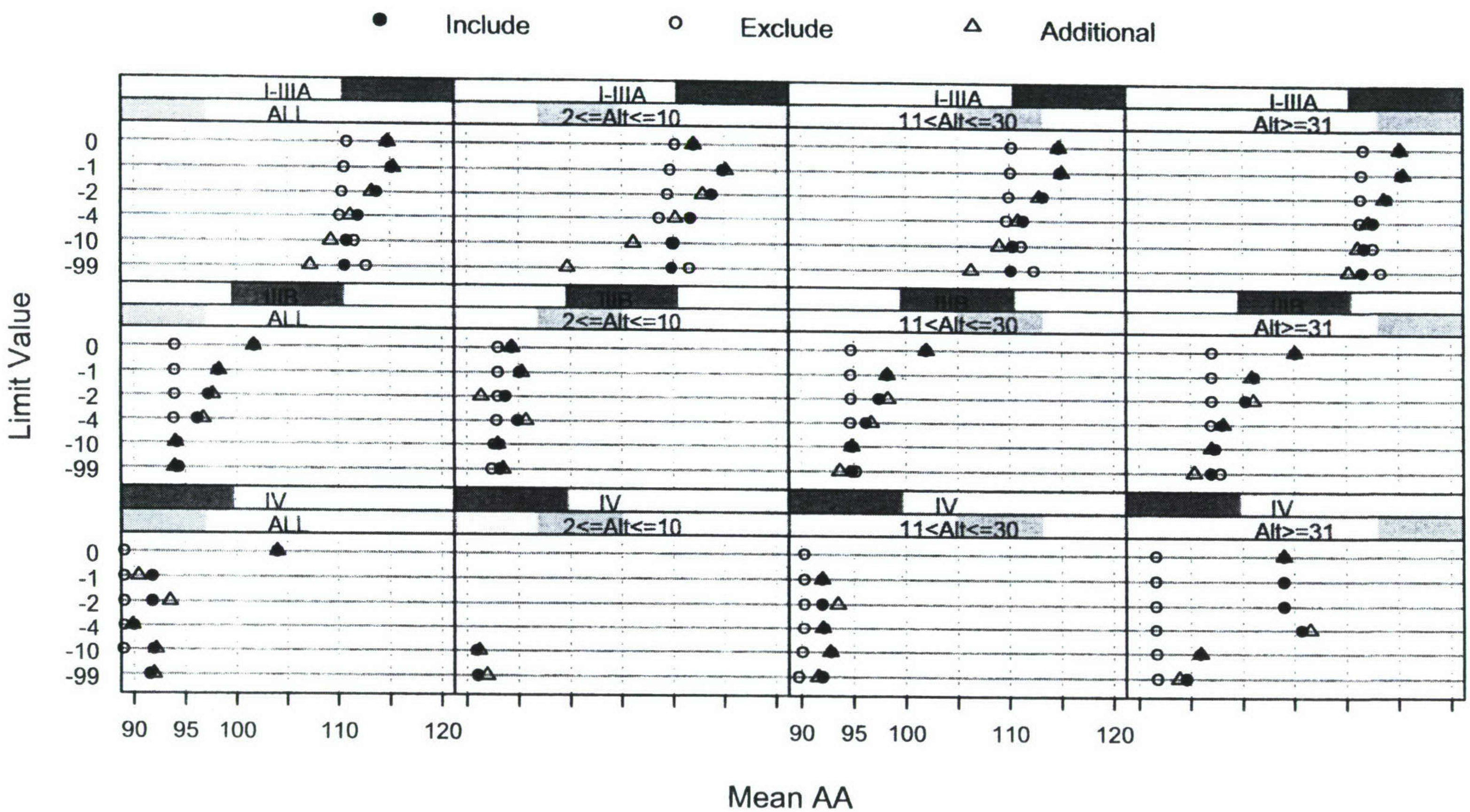

Figure 8. Plot of Mean AA Score of Included, Excluded, and Additional Opportunities in Intersection for All IRB Quarters Combined by AFQT Category and Number of Opportunities.

average AA score for applicants in categories IIIB (10.2 points) and IV (9.5 points) than for applicants in categories I-IIIA (5.1 points). Both women and lower aptitude recruits have more limited options available to them, compared to males and applicants in categories I-IIIA. Although the limitations come from different causes, they have similar effects, in that a bigger performance penalty is paid to place women or lower aptitude applicants in MOS other than those included in optimal solutions.

In order to determine both the type of SG-MOS connection and the reduced-cost limit to use in our simulations, we ran several one-month simulations in which these attributes were varied. In each case, we used a JCM that chose an opportunity uniformly from the top five options. We believed that the use of this JCM would highlight differences between the optimization and merging methods. The average AA scores for these simulations are shown in Figure 9. As the figure shows, the EER produced a higher average AA score than REQUEST when either the truncated mean or the ordinary mean were used. When the truncated mean was used to connect SGs with MOS in the EPAS optimization, the simulated assignments had somewhat higher average AAs. Furthermore, the average AA increased when the reduced-cost limit was relaxed. Based on these results, it was determined to conduct simulations using the SG-MOS connections based on the TM using a maximally relaxed reduced-cost limit.

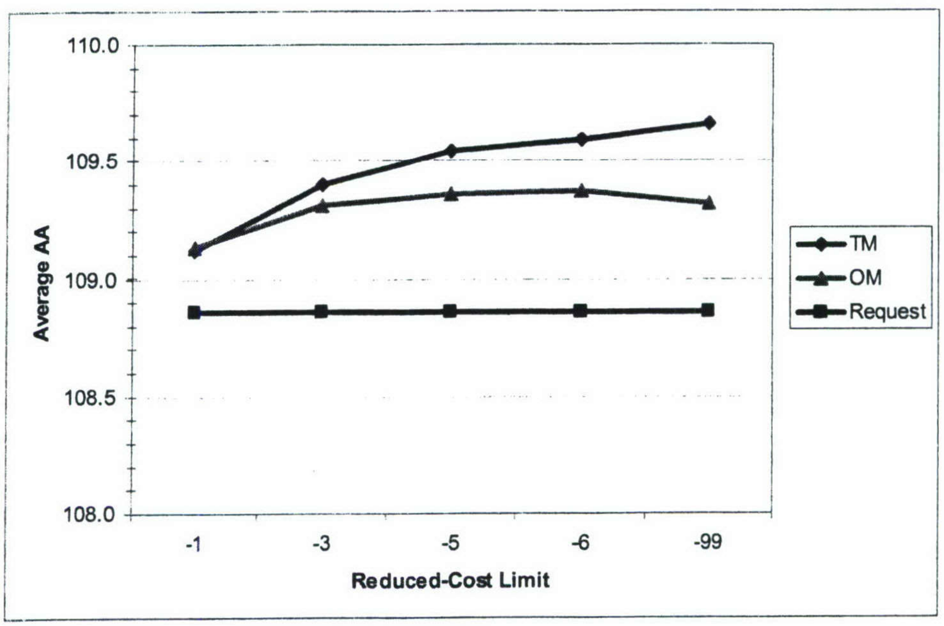

Figure 9. Average AA of one-month REQUEST and EER simulations as a function of reduced-cost limit and SG-MOS connection type.

MPP Classification Efficiency Analysis Results

The analysis of classification efficiency begins by presenting the average AA score for the simulation conditions. It then provides a look at some of the limits to performance that are associated with the integration of EPAS with REQUEST. Finally, it describes counselor effects on training opportunity assignments.

Average AA Score by Simulation Condition

Table 7 shows the average AA score resulting from 12-month simulations of REQUEST and EER, as well as several statistics describing the opportunities available to the applicants in the simulation. In addition to the overall average AA scores, the table provides the results by IRB quarter and for subgroups of the applicant population based on gender, aptitude, and educational status. The first four rows for each population subgroup represent the average AA scores for the following conditions: (a) the actual choices made by applicants in their interaction with the REQUEST system (ActREQ), (b) the simulated assignments for the REQUEST made by the empirical JCM (SimREQ), (c) the simulated assignments for the EER using the empirical JCM (SimEER), and (d) the simulated assignments for an alternative EER that eliminates all opportunities that are not priority MOS and are not included in the EOG (SimEER2).

The last four rows of the table provide statistics that are useful in interpreting the performance of the actual and simulated assignments. These statistics include the following information about the applicants and the opportunities that they were given by REQUEST: (a) the mean AA score for each applicant (MeanUre), (b) the mean AA score of the opportunities that were presented by REQUEST to each applicant (MeanRe), (c) the maximum AA score restricted to the opportunities that were presented to each applicant (MaxRe), and (d) the unrestricted maximum AA score for each applicant (MaxUre). The first two of these statistics give a baseline performance score that would result from a simple random choice. The statistic, MeanUre, could be considered the results of the random choice of AA composite, regardless of whether the applicant was qualified for any MOS using that composite. On the other hand, MeanRe represents the average AA score from a random selection of opportunities from an applicant's REQUEST list. Similarly, MaxRe represents the greatest average AA score that could be obtained from selecting an opportunity from the REQUEST list, while MaxUre represents the unrestricted maximum AA score that could be obtained for each applicant.

Because of the large sample sizes, which can be as high as 92,936 for the entire sample of applicants, all noticeable differences between AA score means are considered statistically significant. However, even a cursory examination of Table 7 indicates that there is no difference in the average AA scores between the actual choices (106.7), the simulated REQUEST assignments (106.8), and the simulated EER assignments (106.8). The lack of difference between the actual choices and the simulated REQUEST assignments indicates that the empirical JCM provides a good fit to the actual choices of applicants, at least in terms of their average AA score. A closer examination of the scores by gender and quarter reveals a slight tendency for the mean AA scores for the simulated REQUEST assignments to overestimate the scores for the actual choices of males and to underestimate the scores for the actual choices of females.

No differences were found in the average AA scores of the simulated assignments for the REQUEST and EER conditions. These two conditions produced equal predicted performance for all quarters and applicant groups. These results indicate that reordering the list of opportunities presented to applicants is not expected to improve their performance in their selected jobs.

Table 7. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Subgroup and IRB Quarter.

		IRB Quarter				
Subgroup	**Type**	**ALL**	**Q1**	**Q2**	**Q3**	**Q4**
Overall	ActREQ	106.7	109.3	107.1	105.8	106.1
	SimREQ	106.8	109.3	107.1	105.8	106.1
	SimEER	106.8	109.3	107.1	105.8	106.1
	SimEER2	106.9	109.3	107.1	105.9	106.5
	MeanUre	105.5	107.3	105.8	104.9	105.0
	MeanRe	106.1	108.3	106.5	105.3	105.4
	MaxRe	109.2	113.1	109.7	107.9	108.1
	MaxUre	110.5	115.2	111.2	109.0	109.2
Male	ActREQ	108.1	110.3	108.4	107.2	107.6
	SimREQ	108.2	110.5	108.4	107.3	107.7
	SimEER	108.2	110.4	108.4	107.3	107.7
	SimEER2	108.1	110.4	108.4	107.3	107.5
	MeanUre	107.3	108.9	107.6	106.6	107.0
	MeanRe	107.8	109.7	108.1	106.9	107.3
	MaxRe	110.7	114.4	111.1	109.4	109.7
	MaxUre	112.0	116.4	112.5	110.4	110.7
Female	ActREQ	101.2	104.1	101.4	100.4	100.7
	SimREQ	101.0	103.9	101.3	99.9	100.5
	SimEER	101.0	104.0	101.2	99.9	100.5
	SimEER2	101.5	104.1	101.3	100.0	101.9
	MeanUre	98.6	100.3	98.8	98.2	98.3
	MeanRe	99.8	102.2	100.1	99.0	99.2
	MaxRe	103.5	107.4	104.3	102.4	102.6
	MaxUre	105.1	109.8	105.7	103.8	104.0
I-IIIA	ActREQ	112.3	113.6	112.4	112.1	111.7
	SimREQ	112.3	113.5	112.6	112.1	111.6
	SimEER	112.3	113.4	112.6	112.1	111.6
	SimEER2	112.2	113.3	112.5	112.0	111.6
	MeanUre	111.3	112.1	111.4	111.2	110.8
	MeanRe	111.5	112.6	111.8	111.4	111.0
	MaxRe	114.9	117.7	115.2	114.2	113.9
	MaxUre	116.2	119.9	116.7	115.2	114.9
IIIB	ActREQ	95.3	98.5	95.6	94.5	94.6
	SimREQ	95.2	98.7	95.5	94.3	94.5
	SimEER	95.2	98.7	95.5	94.3	94.5
	SimEER2	95.2	98.7	95.4	94.2	94.5
	MeanUre	93.5	95.4	93.7	93.1	93.0
	MeanRe	94.6	97.6	95.1	94.0	93.8
	MaxRe	97.3	101.7	97.9	96.3	96.2
	MaxUre	98.6	103.6	99.2	97.5	97.4
IV	ActREQ	90.6	94.7	91.3	89.3	89.1
	SimREQ	90.7	95.2	91.4	89.1	89.1
	SimEER	90.7	95.4	91.5	89.1	89.1
	SimEER2	90.9	95.9	91.6	89.1	89.1
	MeanUre	88.6	90.7	88.9	88.0	87.7
	MeanRe	90.2	93.9	90.9	89.1	88.8
	MaxRe	92.2	97.2	92.9	90.5	90.3
	MaxUre	93.7	99.1	94.6	92.0	91.6

Table 7. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Subgroup and IRB Quarter.

		IRB Quarter				
Subgroup	**Type**	**ALL**	**Q1**	**Q2**	**Q3**	**Q4**
HSDG	ActREQ	106.4	108.7	106.6	105.6	105.7
	SimREQ	106.4	109.0	106.7	105.6	105.6
	SimEER	106.4	108.9	106.7	105.6	105.6
	SimEER2	106.5	108.9	106.7	105.6	105.9
	MeanUre	105.1	106.7	105.4	104.7	104.5
	MeanRe	105.7	107.8	106.1	105.1	104.9
	MaxRe	108.9	112.8	109.5	107.8	107.6
	MaxUre	110.1	114.6	110.7	108.7	108.6
Senior	ActREQ	105.5	107.9	106.0	104.8	105.1
	SimREQ	105.5	107.3	105.7	104.7	105.3
	SimEER	105.5	107.3	105.7	104.7	105.3
	SimEER2	105.8	107.4	105.8	105.0	105.9
	MeanUre	104.1	105.5	104.4	103.5	104.1
	MeanRe	104.7	106.6	105.0	104.0	104.5
	MaxRe	108.0	111.8	108.4	106.8	107.5
	MaxUre	109.2	113.9	109.9	107.9	108.5
Non-Grad	ActREQ	108.9	111.5	109.1	107.1	109.4
	SimREQ	109.0	111.5	109.1	107.2	109.7
	SimEER	109.0	111.5	109.1	107.2	109.7
	SimEER2	109.1	111.6	109.1	107.3	110.0
	MeanUre	108.0	110.0	108.1	106.3	108.7
	MeanRe	108.5	110.8	108.7	106.6	109.0
	MaxRe	111.1	114.6	111.2	109.0	111.3
	MaxUre	112.9	117.7	113.3	110.2	112.8

To investigate the effect of other merge rules that added or deleted opportunities from the REQUEST list, we simulated an alternative rule that deleted from the REQUEST all opportunities that did not represent priority MOS and were not on the EOG. The remaining opportunities were reordered according to their reduced-cost value, just as was the case for the EER. The AA means for this condition are shown in the rows labeled SimEER2 in Table 7. As the table indicates, this merge rule produces a slight improvement in the fourth quarter, when the REQUEST list and EOG have the lowest overlap (75.6%, see Table 5). In the other quarters, where the overlap is greater than 85%, the performance of the alternative rule was no better than that of the original EER. The alternative rule also showed a very slight improvement in predicted performance for females and for applicants in Category IV, both groups with relatively low overlap between the REQUEST list and the EOG.

We considered developing another merge rule that added items from EOG to the REQUEST list. This rule may have promise to improve the average AA for an assignment by including additional opportunities for which the applicant would be expected to perform well. However, in order to evaluate such a rule, it would be necessary to reconstruct the incentives that would be available to the applicant who chose one of the added opportunities. Although this reconstruction is feasible, it required resources beyond what was available in this effort.

One difference between the AA means that is fairly substantial in Table 7 is the difference between quarters. All AA means are greatest in the first quarter and decline so that they have the lowest value in the third and fourth quarters. While the decrease can be due to seasonal variation, we believe that it is due to the discontinued use of two of the ASVAB tests that occurred in January 2002, and possibly to the implementation of regression-based AA composites which have better predictive validity but likely lower differential validity. Applicant AA scores for the first quarter were based on the older system, while those in the third and fourth quarters were based on the new system. As shown previously in Table 3, the second IRB quarter began in early December 2001. Consequently, that quarter includes a mix of the old and new composites.

Limits to Average AA Scores for Assignments

Table 8 compares the overall simulation results to several statistics of the applicant aptitude distribution. The results are similar to those for the evaluations of earlier versions of EPAS shown in Table 2, but the current results show a much smaller range between the overall average AA (the expected result of random assignment to training opportunities) and the average of the applicants' highest AA scores. It is clear from the table that there was much less room for improved performance due to increased classification efficiency in the current simulations than there was in the previous evaluations. Integration of EPAS with REQUEST limits the impact of optimization in two ways: (a) the highest AA score is lower within the REQUEST opportunities than it is overall, and (b) the average AA within the REQUEST opportunities is higher than it is overall.[10] As was the case in earlier analyses, the planning mode performance is nearly as good as possible given the SG partition. However, the performance of the simulation was not as good as the planning mode results, probably due to the use of a more realistic empirical JCM, rather than simply choosing the top option from the EOG.

Table 8. Comparison of Simulation Results to Aptitude Distribution Statistics

Statistic	**Value**
Aptitude Distribution Statistics	
Applicants' Highest AA	110.5
Applicant's Highest AA among REQUEST Opportunities	109.2
Applicant SG Highest AA	108.3
Applicant SG Highest AA Less TSC IV	108.5
Actual Contractees' Average AA	106.7
Average AA within REQUEST Opportunities	106.1
Random Assignments Average AA	105.5
Simulation Results	
Planning Mode	107.8
Simulation of REQUEST Only	106.8
Simulation of EER	106.8

[10] The difference between the "Applicant's Highest AA among REQUEST Opportunities" and the "Average AA within REQUEST Opportunities" represents all the classification room that EPAS has to work with under the present simulation field test design.

Figure 10 shows the mean AA for the actual applicant choices, and the simulated REQUEST and EER assignments, along with the two values that give upper and lower bounds for the mean AA of an assignment. These values are presented by IRB quarter and by the number of opportunities presented to the applicant (applicants presented a single opportunity are not shown in the figure). Reading from left to right on each plot are the unconstrained mean AA (MeanUre), the constrained mean AA (MeanRe), the mean AA for the actual and simulated assignments (since these three values are essentially identical, their plots overlap), the constrained maximum AA (MaxRe), and the unconstrained maximum (MaxUre). Examination of the figure reveals systematic patterns related to the number of opportunities and IRB quarter. Specifically, all of the AA measures increased as the number of opportunities increased. That is, applicants who were presented with more opportunities received opportunities for which they had higher AA scores. Furthermore, as the number of alternatives increased, the restricted and unrestricted values for the average AA and the maximum AA converged. Thus, applicants who were offered many opportunities had higher scores, and were given a wide variety of MOS that included most of the composites.

Regarding variation by IRB quarter, the figure details the same result that was shown in Table 7 by number of alternatives. As the figure shows, all values decrease between the first and third quarter, while the values for the third and fourth quarter are essentially the same. Furthermore, the range between the mean and maximum (either constrained or unconstrained) was smaller in the later quarters, indicating there was less potential for gain due to EPAS in those quarters. Figure 11, Figure 12, and Figure 13 illustrate the same mean and maximum AA scores as a function of gender, aptitude, and educational status, respectively. The relationships shown in these figures were similar to the overall relationships shown in Figure 10.

Counselor Performance and AA Assignment Effects

The JCM reflects the condition that some counselors are better able than others to persuade applicants to choose highly ranked opportunities. This analysis estimated the effects of improved counselor performance on average AA. It also examined the effect of removing the weight given to AA in the JCM.

The number of conditions and the time required to conduct a simulation precluded the use of a simulation to address this issue. Consequently, we addressed this issue using analytical simulation. The analytical simulation summed the choice probabilities to obtain an expected AA distribution, and then calculated the mean AA score based on this distribution. Analytical simulations can quickly estimate the mean AA score for many conditions, but do not incorporate factors such as requirements or available training seats. Consequently, they can provide an initial estimate of the magnitude of an effect that can then be investigated more precisely using traditional simulation.

The analysis showed no effect of varying counselor performance over a reasonable range of the average AA for either the REQUEST or the EER condition. Removing the AA parameter in the JCM reduced the average AA for both conditions to the same extent, but did not increase the difference between the conditions. Results for the analysis are shown in Appendix G.

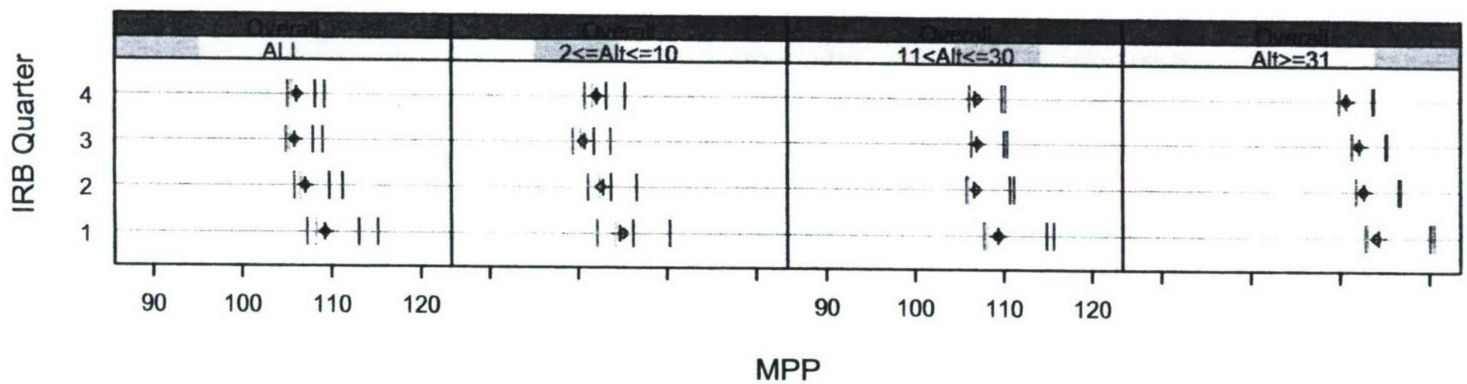

Figure 10. Plot of mean AA for actual REQUEST, simulated REQUEST, and EPAS-enhanced REQUEST conditions for full sample by number of opportunities. Values are bounded in increasing order by unconstrained and constrained mean AA and constrained and unconstrained maximum AA.

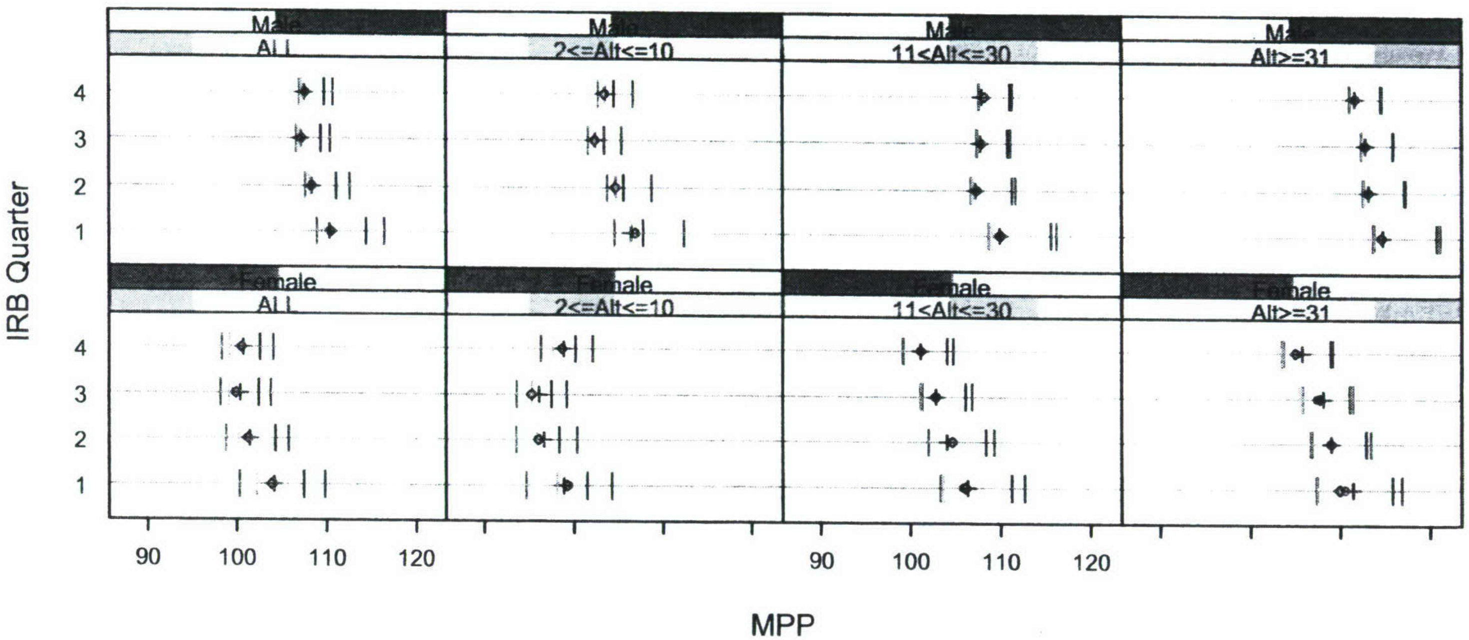

Figure 11. Plot of mean AA for actual REQUEST, simulated REQUEST, and EPAS-enhanced REQUEST conditions by gender and number of opportunities. Values are bounded in increasing order by unconstrained and constrained mean AA and constrained and unconstrained maximum AA.

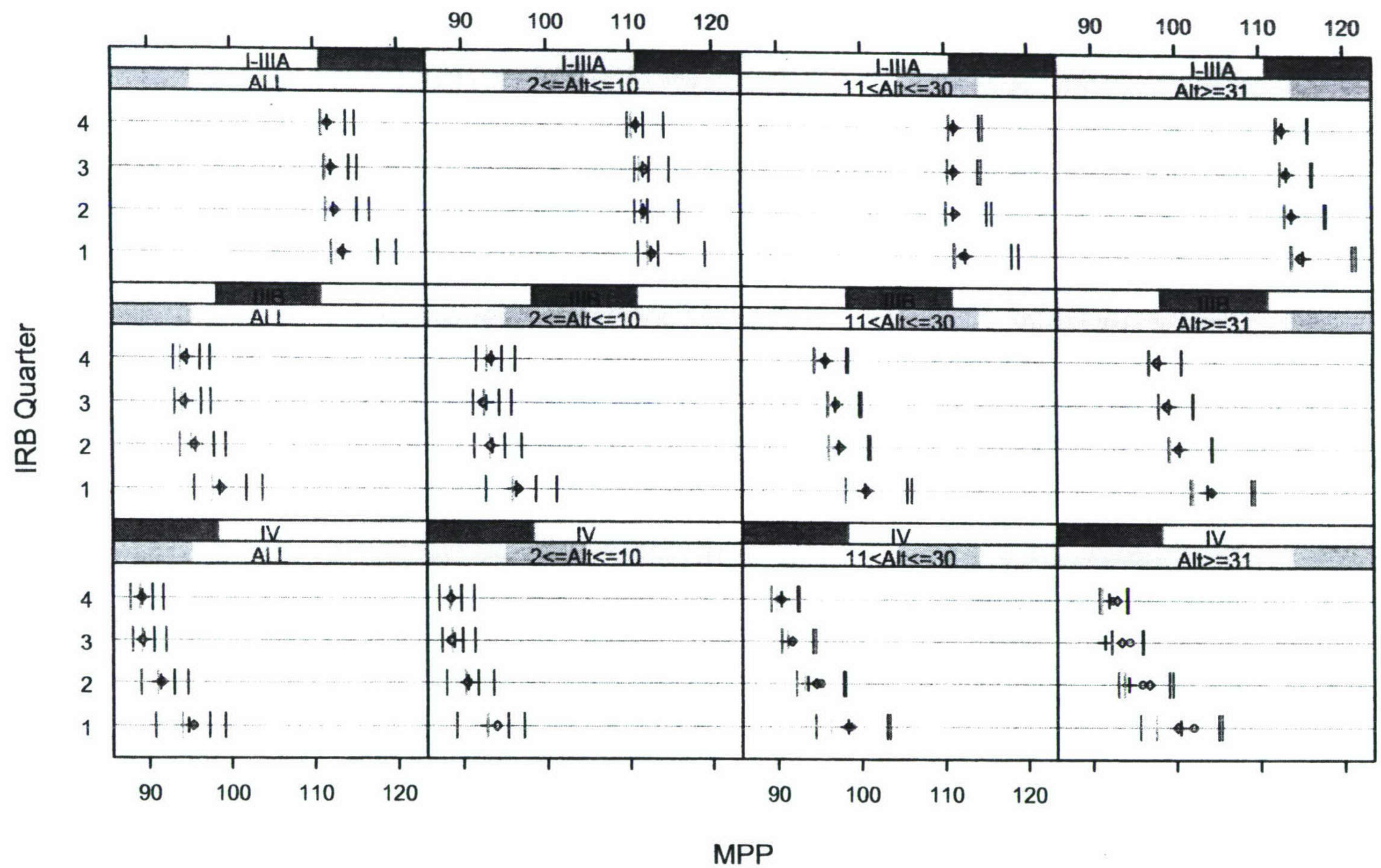

Figure 12. Plot of mean AA for actual REQUEST, simulated REQUEST, and EPAS-enhanced REQUEST conditions by AFQT category and number of opportunities. Values are bounded in increasing order by unconstrained and constrained mean AA and constrained and unconstrained maximum AA.

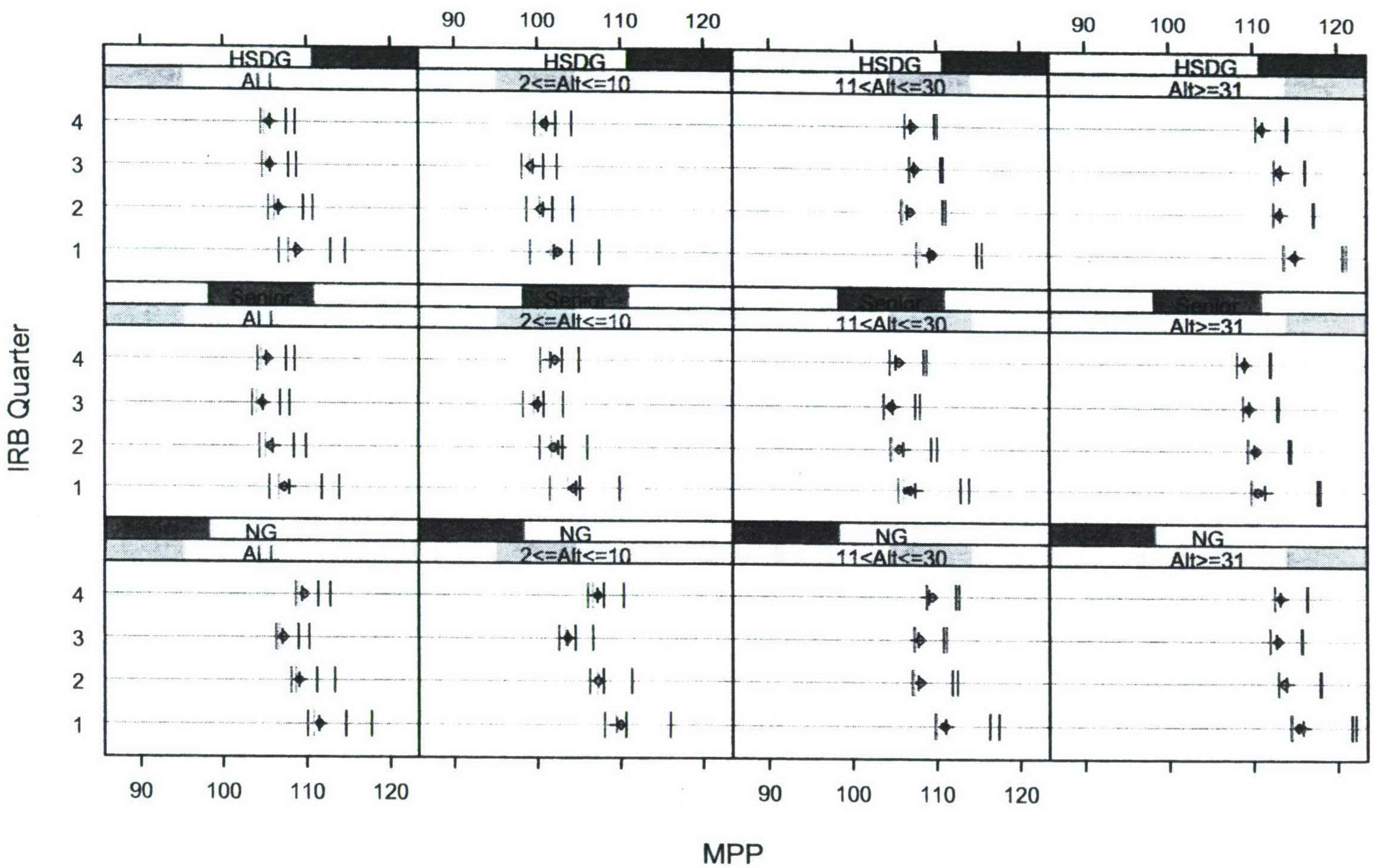

Figure 13. Plot of mean AA for actual REQUEST, simulated REQUEST, and EPAS-enhanced REQUEST conditions by education status and number of opportunities. Values are bounded in increasing order by unconstrained and constrained mean AA and constrained and unconstrained maximum AA.

DISCUSSION

The goal of this research was to conduct a field evaluation of an EPAS-enhanced REQUEST system that was both realistic and non-intrusive. We have been aided in this effort by the ability to extract the opportunities that were actually presented to FY 2002 applicants by the REQUEST system. This set of opportunities provided a highly realistic scenario to use as the basis for the field test. In addition to the opportunities, the requirements, available training dates and seats, priority MOS, and enlistment incentives all reflected the actual situation during FY 2002. Because simulated job choices are not always the same as the actual choices, the conditions in the simulation may drift from those that actually occurred. However, by adjusting the actual list of opportunities produced by REQUEST to eliminate classes that have filled, and by conducting monthly runs of EPAS to ensure that requirements are met, the effect of drift in the simulation was reduced.

The results of the analysis indicate that use of EPAS to modify the list of opportunities produced by REQUEST can increase the visibility of opportunities in which an applicant would be likely to perform well, given his or her aptitudes. The REQUEST-EOG intersection was substantial, and the opportunities that were included in both lists had substantially higher average AA than the REQUEST opportunities that were not included in the EOG. Furthermore, increasing the prominence of the opportunities included in the EOG exacts only a small penalty on the visibility of priority MOS. Despite the substantial and largely positive effect of EPAS on the opportunity lists, however, there is essentially no difference in the average AA composite score between the two conditions. The lack of improvement from the use of the EER appears to derive from a combination of factors: modest classification efficiency on the part of REQUEST, the limited efficacy of the merge rule and the reordering process (as brought to light by better understanding and modeling of applicant job-choice behavior), and the formulation of the AA composites that are used to predict performance.

This field evaluation had the benefit of access to the actual MOS training opportunities presented to applicants by REQUEST. Analysis of these opportunities revealed that REQUEST showed modest classification efficiency, with the average AA score among opportunities generated by REQUEST somewhat greater than the overall average AA score in the applicant population. This result has the effect of setting a higher bar in the evaluation of the EER. On the other hand, applicants' highest AA scores among REQUEST opportunities were somewhat less than their overall maximum AA scores, indicating that the REQUEST list often did not include training for MOS that exercised applicants' best aptitude areas. The implication of this result is that restricting EPAS to reorder the opportunities generated by REQUEST decreases the magnitude of the improvement that is possible.

One critical element of the classification process that had not been addressed in earlier EPAS evaluations is the applicant's choice of MOS and training date from the available opportunities. Previous EPAS evaluations had assumed that this choice is based primarily on the rank of opportunities on the REQUEST list. The data collected from the REQUEST system gave Diaz, Ingerick, and Sticha (2007) a chance to evaluate the assumptions about applicant choice that were made by previous EPAS evaluations. The results of their analysis indicated that these assumptions did not accurately reflect applicant choices. In particular, applicants do not restrict their choices to the top few opportunities on the REQUEST list that have the highest priority for the Army. When they are presented many opportunities, they are nearly as likely to select jobs from the last half as they are from the first half of the list. In fact, Diaz et al. indicated that rank in the list had a relatively small impact on applicant job choice, and that only some Army job counselors are able to persuade applicants to choose the high priority jobs at the top of the REQUEST list.

The development of the empirical JCM revealed some other characteristics of applicant job choice that limit the potential improvement that can be obtained when the REQUEST list is reordered to reflect the values established by EPAS to maximize the mean AA score. Primary among these characteristics is the finding that applicants already tend to choose jobs in which they perform well. That is, AA is a significant factor in the JCM. In addition, in the current system, the Army job priorities are reinforced by monetary (and other) incentives, which clearly have a positive impact in applicant choice probability. When the REQUEST list is reordered according to the EOG, the effect of rank and incentives is decoupled, and the overall tendency to choose jobs from the top of the list will appear even weaker than it does in the original REQUEST list.

The contribution of the rank order term to total utility of the applicant represents a "partial effect" as in typical regression analysis. It is "partial" in the sense that it accounts for the applicant's utility not already explained by monetary incentives and other factors included in the utility function. This note is important since monetary incentives and rank order are highly correlated by design. A utility model that fails to properly account for monetary benefits will overestimate the role of guidance counselors in applicant selection of high ranking MOS alternatives. That is, it will confound counselor ability with the effects of monetary incentives and, therefore, lead to biased EPAS field test results.

The details of the JCM provide a context in which the simulation results regarding the classification efficiency of EPAS can be interpreted. These results show no effect of reordering the REQUEST list to reflect the EOG on the average AA score of the simulated assignments. However, given the characteristics of the applicant job-choice process revealed by the JCM, it is difficult to imagine that an intervention that merely reordered opportunities – without adding or deleting any – could produce a substantial improvement in overall MPP. The results do lead to the question of what other ways EPAS could interact with REQUEST to improve overall performance. The results of this evaluation address this question to a limited extent and suggest future analyses that could shed additional light.

The most straightforward way to integrate EPAS and REQUEST within the current framework would consist of the following three steps: (a) opportunities with available training seats that are included in the EOG, but not in the REQUEST list, would be added to the list; (b) opportunities from the REQUEST list that do not represent priority MOS and are not included in the EOG would be removed from consideration; and (c) opportunities from the REQUEST list that represent priority MOS would remain on the list, whether or not they were in the EOG. Given the small effect of rank order, it is optional whether the newly merged list would be ordered according to the reduced cost from the EPAS optimization. Several difficulties of adding opportunities to the REQUEST list made it infeasible to implement this process in the current evaluation. In the first place, it would be necessary to determine whether an individual applicant was qualified for the additional MOS. REQUEST has more detailed criteria for determining eligibility for MOS than are considered in EPAS. In the second place, it would be necessary to specify the incentives associated with any MOS taken from the EOG that was not on the REQUEST list. In principle, it is possible to overcome these difficulties to accurately reflect the opportunities from the EOG that would be added to the REQUEST list. A detailed model of MOS eligibility could be determined through a review of appropriate documentation. Similarly, a procedure to determine the level of incentives could be based on the procedure that was used to reconstruct the missing incentives in the existing database. However, these procedures are time consuming and were beyond what could be accomplished in the current evaluation. They remain reasonable candidates for future research.

In this evaluation, we were able to implement a merge rule that combined the second and third steps of the previously described integration process. The result indicated that an improvement in mean AA was possible in conditions in which the level of overlap between the EOG and the REQUEST list were somewhat lower, most notably in the fourth quarter of our analysis. This result suggests that a more stringent value for the reduced cost limit used to define the EOG may produce additional improvements in conjunction with the use of a revised merge rule. This topic is a good candidate for future analyses using the simulation capabilities developed for this evaluation.

It would also be possible to improve the performance of EPAS by changing some of the characteristics of the optimization or the definition of some of its constructs. For example, supply groups have been defined by demographic characteristics, and by a cluster analysis of applicant aptitude scores. These clusters may not adequately characterize the aptitudes of all their members, leading to situations in which EPAS allocates a supply group to an MOS for which a portion of its members are not qualified. The current EPAS software permits a much larger number of supply groups than is currently incorporated, a capability that would allow for the development of more narrowly focused supply groups that better characterize their members. In addition, different clustering strategies may be employed for different subsets of the total supply. For example, applicants in AFQT Categories I-IIIA may be clustered separately from applicants in Category IIIB or IV. With these inputs, EPAS should be better able to capitalize on the aptitude differences between supply groups.

It may also be possible to improve the performance of EPAS by using unstandardized PP composites in the objective function, rather than the standardized composites that are currently used. Use of standardized composites reduces classification efficiency, because composites with lower validity (less variance) have the same weight in the objective function as those with higher validity (Zeidner, Johnson, et al., 2000; Diaz, Ingerick, & Lightfoot, 2005). This has the benefit of spreading quality more uniformly across MOS, but that function is already accomplished by the myriad constraints within the EPAS optimization problem.

The evaluation was based on data from a year (FY 2002) that saw a major change to the definition of AA composites. In January 2002, the Army ASVAB composites were changed in two important ways: (a) Two speeded tests—Numerical Operations and Coding Speed—were removed from the test; and (b) unit weighted AA composites were replaced with regression-based estimates. An additional subtest—Assembling Objects—was also added to the test, but it was not incorporated into any of the composites. Our analysis of the REQUEST opportunities during FY 2002 indicated that the range between the mean and the maximum AA score for the opportunities generated by REQUEST decreased with the introduction of the new composites. Thus, when expressed in terms of AA points, the potential increase that EPAS could bring about by affecting the choice probabilities for the REQUEST opportunities was reduced by the introduction of the new composites. Similarly, the range between the unrestricted mean and maximum AA score for each applicant decreased, limiting the ability of EPAS to improve classification efficiency by adding to or subtracting from the list of opportunities produced by REQUEST.

In general, the effects of the new AA composites are not surprising. The elimination of the two speeded tests produced a more homogeneous set of ASVAB subtests, which decreased classification efficiency. Given these results, it is reasonable to consider adding predictors that address other aptitudes or personal characteristics—such as personality, values, or interest—to the predictor set. Along with changes to the objective function to incorporate an expanded set of criteria, these additions could be expected to enhance the classification efficiency that is possible and to improve the predicted performance of Army personnel. Both EPAS and the simulation capability developed for the EPAS field test could serve as a test-bed to propose and evaluate classification concepts.

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Appendix A

List of Acronyms

Acronym	Definition
AA	Aptitude Area
AB	Airborne
ACF	Army College Fund
AFQT	Armed Forces Qualification Test
AMB	Accession Management Branch
ASVAB	Armed Services Vocational Aptitude Battery
ATRRS	Army Training Requirements and Resources System
DEP	Delayed Entry Program
DMPM	Directorate of Military Personnel Management
EB	Enlistment Bonus
EER	EPAS-Enhanced REQUEST
EIRB	Enlistment Incentive Review Board
EPAS	Enlisted Personnel Allocation System
EPMD	Enlisted Personnel Management Directorate
EOG	EPAS Optimal Guidance
FLS	Full Least Squares
FY	Fiscal Year
HG	Hi Grad
HRC	Human Resources Command
JCM	Job Choice Model
MEPS	Military Entrance Processing Station
MOS	Military Occupational Specialty
MPP	Men Predicted Performance
OM	Ordinary Mean
NPS	Non-Prior Service
PC	Personal Computer
PP	Predicted Performance
RECSTA	Reception Station
REQUEST	Recruit Quota System
SB	Seasonal Bonus
SG	Supply Group
TM	Truncated Mean
TOS	Term of Service
TRADOC	U.S. Army Training and Doctrine Command
TRAP	Training Resource Arbitration Panel
USAREC	U.S. Army Recruiting Command
YTD	Year to Date

Appendix B

Specifications for EPAS Input

File AMB_TARGET.CSV

Monthly Accession Targets

Columns

Name	Type	Optional	Default	Comments
MONTH	NUMBER	Y		Identifies the month of the record (1 thru 12 starting with October)
ACCESSIONS	NUMBER	Y		Accessions required
INFLATION	NUMBER	Y		Factor to inflate accessions by to account for estimated attrition loss, expressed as a percentage (e.g., 18.4)

File DEP_POLICY.CSV

Delayed Entry Program policy, maximum months in DEP by AFQT category

Columns

Name	Type	Optional	Default	Comments
TSC_1_3A	NUMBER	Y		Maximum DEP length for Cat 1-3A, in months
TSC_3B	NUMBER	Y		Maximum DEP length for Cat 3B, in months
TSC_4	NUMBER	Y		Maximum DEP length for Cat 4, in months

File DEP_POLICY_HS.CSV

High School Delayed Entry Program policy, maximum months in DEP

Columns

Name	Type	Optional	Default	Comments
BEGIN	NUMBER	Y		When DEP starts, i.e., contract month (1-12)
FIRST	NUMBER	Y		First available accession month
LAST	NUMBER	Y		Last available accession month

File MOS_MANAGEMENT.CSV

Military Occupational Specialty (MOS) management

Columns

Name	Type	Optional	Default	Comments
MOS	VARCHAR2(4)	Y		Military Occupational Specialty (MOS) (e.g., 11X)
TOP25	NUMBER	Y		Top 25 (1=Top 25; 0=not Top 25)
TARGET	VARCHAR2(3)	Y		Is target? (yes or no)

TRAINING	VARCHAR2(4)	Y		Training type (OSUT or AIT)
MEN	VARCHAR2(3)	Y		Requires men only? (yes or no)
QUALITY	VARCHAR2(3)	Y		Requires quality (TSC 1-3A)? (yes or no)
GRADUATE	VARCHAR2(3)	Y		Requires high school graduate? (yes or no)

File MOS_MANAGEMENT_APPTITUDE.CSV

Aptitude Area composite cut score for each MOS. Note misspelling in file name.

Columns

Name	Type	Optional	Default	Comments
MOS	VARCHAR2(4)	Y		MOS (e.g., 96R)
AREA	VARCHAR2(20)	Y		Aptitude area composite (e.g., EL)
SCORE	NUMBER	Y		Aptitude area cut score (e.g., 85)

File MOS_MANAGEMENT_PRIORITY.CSV

MOS minimum fills by month

Columns

Name	Type	Optional	Default	Comments
MOS	VARCHAR2(4)	Y		MOS
OCT	NUMBER	Y		Minimum fill for MOS in October
NOV	NUMBER	Y		Minimum fill for MOS in November
DEC	NUMBER	Y		Minimum fill for MOS in December
JAN	NUMBER	Y		Minimum fill for MOS in January
FEB	NUMBER	Y		Minimum fill for MOS in February
MAR	NUMBER	Y		Minimum fill for MOS in March
APR	NUMBER	Y		Minimum fill for MOS in April
MAY	NUMBER	Y		Minimum fill for MOS in May
JUN	NUMBER	Y		Minimum fill for MOS in June
JUL	NUMBER	Y		Minimum fill for MOS in July
AUG	NUMBER	Y		Minimum fill for MOS in August
SEP	NUMBER	Y		Minimum fill for MOS in September

File SUPPLY_GROUP.CSV

Supply group definitions (sex, edstat, afqt)

Columns

Name	Type	Optional	Default	Comments
SUPPLY_GROUP	NUMBER	Y		1-n, identifies supply group
SEX	VARCHAR2(1)	Y		Supply group sex: (M)Male, (F)Female

EDSTAT	VARCHAR2(1) Y		Supply group education status: (G)Graduate, (S)Senior, (N)Non-Grad
AFQT2	VARCHAR2(1) Y		Supply group quality level: (A)TSC 1-3A, (B)TSC 3B, (C)TSC 4

File SUPUPLY_GROUP_APPTITUDE.CSV

Scores for each composite/test area for supply groups

Columns

Name	Type	Optional	Default	Comments
SUPPLY_GROUP	NUMBER	Y		Identifies supply group (1-150)
COLUMN1	NUMBER	Y		Average test score for 1st composite
COLUMN2	NUMBER	Y		Average test score for 2nd composite
COLUMN3	NUMBER	Y		Average test score for 3rd composite
COLUMN4	NUMBER	Y		Average test score for 4th composite
COLUMN5	NUMBER	Y		Average test score for 5th composite
COLUMN6	NUMBER	Y		Average test score for 6th composite
COLUMN7	NUMBER	Y		Average test score for 7th composite
COLUMN8	NUMBER	Y		Average test score for 8th composite
COLUMN9	NUMBER	Y		Average test score for 9th composite

File SUPPLY_GROUP_COST.CSV

Values of Supply Group for a given MOS cut score

Columns

Name	Type	Optional	Default	Comments
SUPPLY_GROUP	NUMBER	Y		Identifes supply group
CL_ID	VARCHAR2(8)	Y		Cluster ID for supply group
SEX	VARCHAR2(6)	Y		Sex for supply group (male or female)
EDSTAT	VARCHAR2(10)	Y		Educational status for supply group (HSDG, Senior, Nongrad)
AFQT2	VARCHAR2(6)	Y		AFQT Category for supply group (I-IIIA, IIIB, IV)
CUTSCORE	NUMBER	Y		Identifies the cut score
S_GM	NUMBER	Y		Cost value for GM at cut score
S_EL	NUMBER	Y		Cost value for EL at cut score
S_CL	NUMBER	Y		Cost value for CL at cut score
S_MM	NUMBER	Y		Cost value for MM at cut score
S_SC	NUMBER	Y		Cost value for SC at cut score
S_CO	NUMBER	Y		Cost value for CO at cut score
S_FA	NUMBER	Y		Cost value for FA at cut score

S_OF	NUMBER	Y	Cost value for OF at cut score
S_ST	NUMBER	Y	Cost value for ST at cut score
S_GT	NUMBER	Y	Cost value for GT at cut score

File SUPLY_GROUP_POPULATION.CSV

Forecasted population for a given supply group

Columns

Name	Type	Optional	Default	Comments
SUPPLY_GROUP	NUMBER	Y		Identifies supply group
OCT	NUMBER	Y		SG Population forecast for October
NOV	NUMBER	Y		SG Population forecast for November
DEC	NUMBER	Y		SG Population forecast for December
JAN	NUMBER	Y		SG Population forecast for January
FEB	NUMBER	Y		SG Population forecast for February
MAR	NUMBER	Y		SG Population forecast for March
APR	NUMBER	Y		SG Population forecast for April
MAY	NUMBER	Y		SG Population forecast for May
JUN	NUMBER	Y		SG Population forecast for June
JUL	NUMBER	Y		SG Population forecast for July
AUG	NUMBER	Y		SG Population forecast for August
SEP	NUMBER	Y		SG Population forecast for September

Appendix C

Size of REQUEST-EOG Intersection

Table C1. Size of REQUEST-EOG Intersection as Percentage of the REQUEST List by Number of Opportunities, Subgroup, and Limit Value for IRB=1.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	-99	85.4	80.0	79.2	89.5	88.1
Overall	-10	77.7	75.4	70.3	80.8	81.9
Overall	-4	45.6	44.6	39.1	46.0	52.2
Overall	-2	25.4	24.1	23.4	24.8	29.0
Overall	-1	11.6	13.6	12.6	9.9	12.2
Overall	0	1.5	2.3	2.4	0.8	1.2
Male	-99	86.3	81.6	79.8	90.1	88.6
Male	-10	80.4	77.7	73.1	83.2	83.9
Male	-4	50.0	49.0	44.4	50.0	55.3
Male	-2	28.5	26.8	28.1	27.5	31.0
Male	-1	13.4	15.2	15.5	11.4	13.5
Male	0	1.8	2.8	3.1	0.9	1.3
Female	-99	81.6	73.6	77.5	87.0	84.8
Female	-10	66.4	66.7	62.1	69.2	68.7
Female	-4	26.8	27.2	23.7	27.1	32.1
Female	-2	12.1	13.6	9.7	12.1	15.9
Female	-1	4.0	7.5	4.0	2.8	3.6
Female	0	0.2	0.3	0.4	0.1	0.2
I-IIIA	-99	86.0	79.3	76.9	90.2	88.7
I-IIIA	-10	80.8	77.5	74.5	83.4	82.5
I-IIIA	-4	53.2	56.5	55.5	51.6	52.7
I-IIIA	-2	30.1	31.7	36.5	27.4	29.1
I-IIIA	-1	14.3	18.6	20.7	11.3	12.5
I-IIIA	0	1.9	3.4	4.4	0.9	1.2
IIIB	-99	91.3	92.6	91.9	91.6	84.4
IIIB	-10	75.9	82.1	73.6	75.9	77.3
IIIB	-4	28.9	24.1	24.5	31.3	47.6
IIIB	-2	14.5	10.2	10.1	17.6	29.1
IIIB	-1	5.0	4.2	3.9	5.6	8.9
IIIB	0	0.3	0.0	0.3	0.3	0.6
IV	-99	47.4	39.7	43.9	61.4	18.5
IV	-10	38.6	30.2	34.9	52.8	18.5
IV	-4	8.3	3.4	5.8	16.5	9.9
IV	-2	5.2	0.9	2.2	14.1	7.0
IV	-1	2.3	0.0	1.5	5.6	2.5
IV	0	0.2	0.0	0.1	0.2	0.5
HSDG	-99	90.8	89.4	88.2	92.5	90.9
HSDG	-10	80.4	82.7	74.6	81.7	83.0
HSDG	-4	44.0	42.2	33.8	45.4	52.4
HSDG	-2	22.9	23.2	18.3	23.1	27.0
HSDG	-1	9.4	12.1	8.6	8.5	10.5
HSDG	0	1.5	2.9	1.7	1.0	1.5
Senior	-99	75.8	57.4	66.8	81.0	81.8
Senior	-10	70.0	53.6	61.7	73.7	76.4
Senior	-4	40.7	26.8	35.0	39.8	49.0
Senior	-2	24.2	15.3	22.6	22.6	29.0
Senior	-1	12.1	8.7	13.6	10.2	13.6
Senior	0	1.3	0.5	3.2	0.4	0.8
Non-Grad	-99	79.6	72.0	70.9	87.2	87.7
Non-Grad	-10	76.9	70.6	67.9	83.5	86.1
Non-Grad	-4	53.1	54.1	51.7	52.4	56.1
Non-Grad	-2	32.3	28.2	33.2	31.6	35.7
Non-Grad	-1	16.4	17.7	19.4	13.5	15.8
Non-Grad	0	1.6	1.9	3.2	0.4	0.7

Table C2. Size of REQUEST-EOG Intersection as Percentage of the REQUEST List by Number of Opportunities, Subgroup, and Limit Value for IRB=1.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	-99	85.2	77.7	79.4	90.0	88.3
Overall	-10	79.1	72.6	73.7	82.2	83.7
Overall	-4	44.7	42.9	36.5	44.5	54.9
Overall	-2	22.8	21.9	18.0	21.8	29.7
Overall	-1	10.4	12.5	9.4	8.9	12.7
Overall	0	1.1	1.5	1.7	0.6	0.8
Male	-99	86.1	79.2	80.1	90.7	88.8
Male	-10	81.3	74.3	75.9	84.5	85.1
Male	-4	48.5	47.0	40.7	47.7	57.3
Male	-2	25.8	25.7	21.7	24.3	31.6
Male	-1	12.3	14.9	11.6	10.5	14.1
Male	0	1.3	1.9	2.2	0.6	0.9
Female	-99	81.4	72.8	77.3	87.4	85.4
Female	-10	70.5	67.1	67.7	73.1	74.1
Female	-4	30.0	29.7	24.7	31.5	39.0
Female	-2	10.8	9.6	7.6	11.8	16.8
Female	-1	3.1	4.4	3.3	2.4	3.3
Female	0	0.2	0.2	0.2	0.2	0.2
I-IIIA	-99	85.3	75.3	77.9	89.7	88.3
I-IIIA	-10	81.9	74.0	75.8	85.1	84.7
I-IIIA	-4	56.5	56.3	56.5	55.6	57.4
I-IIIA	-2	30.4	32.7	31.5	28.2	31.4
I-IIIA	-1	14.2	18.9	17.0	11.7	13.6
I-IIIA	0	1.5	2.3	3.2	0.7	0.9
IIIB	-99	93.2	93.4	93.5	93.8	89.4
IIIB	-10	80.7	80.9	82.9	79.2	75.5
IIIB	-4	19.9	22.3	16.9	20.1	30.6
IIIB	-2	6.1	3.9	3.9	7.7	12.9
IIIB	-1	2.1	1.5	1.4	2.5	4.3
IIIB	0	0.2	0.1	0.1	0.2	0.4
IV	-99	36.9	26.8	29.9	62.0	46.0
IV	-10	28.2	19.6	25.0	43.1	23.2
IV	-4	6.7	7.2	5.5	10.0	3.1
IV	-2	1.5	0.7	0.8	3.9	2.5
IV	-1	0.7	0.7	0.6	1.1	0.2
IV	0	0.2	0.0	0.1	0.3	0.2
HSDG	-99	90.7	87.5	88.3	92.9	91.2
HSDG	-10	82.7	80.4	80.1	83.1	85.7
HSDG	-4	44.1	42.7	33.2	43.9	55.9
HSDG	-2	21.3	21.0	14.9	20.6	28.8
HSDG	-1	8.8	11.0	7.2	7.6	11.2
HSDG	0	1.1	1.6	1.8	0.6	1.0
Senior	-99	77.0	65.5	65.8	83.9	82.7
Senior	-10	73.5	62.8	63.6	79.3	78.8
Senior	-4	40.0	31.9	29.5	40.5	51.0
Senior	-2	22.2	11.8	14.8	22.3	31.5
Senior	-1	9.7	5.9	6.9	9.1	13.8
Senior	0	0.6	0.9	0.8	0.5	0.5
Non-Grad	-99	78.7	69.9	71.9	87.1	86.3
Non-Grad	-10	75.2	66.5	68.8	82.6	83.6
Non-Grad	-4	50.3	47.3	47.9	50.5	57.0
Non-Grad	-2	26.8	26.8	26.2	25.2	30.2
Non-Grad	-1	15.1	16.7	15.6	12.6	16.5
Non-Grad	0	1.3	1.6	2.2	0.5	0.7

Table C3. Size of REQUEST-EOG Intersection as Percentage of the REQUEST List by Number of Opportunities, Subgroup, and Limit Value for IRB=3.

Subgroup	Type	Number of Opportunities All	1	2-10	11-30	>=31
Overall	-99	85.4	78.7	79.0	90.3	89.6
Overall	-10	78.2	72.3	70.9	82.2	85.1
Overall	-4	41.8	37.7	29.8	45.7	55.1
Overall	-2	21.4	19.5	14.4	22.9	30.4
Overall	-1	9.6	9.4	6.6	10.1	13.4
Overall	0	0.6	0.8	0.6	0.5	0.6
Male	-99	87.3	80.2	82.0	91.3	90.4
Male	-10	81.8	73.8	75.7	85.2	87.4
Male	-4	46.3	40.0	33.9	49.8	58.9
Male	-2	25.2	22.0	17.9	26.2	34.0
Male	-1	11.6	10.9	8.4	12.0	15.4
Male	0	0.7	0.8	0.7	0.6	0.7
Female	-99	78.1	73.2	71.4	85.4	85.2
Female	-10	64.7	66.9	59.0	67.8	72.9
Female	-4	25.2	29.8	19.3	26.8	34.5
Female	-2	7.5	10.6	5.6	7.4	10.8
Female	-1	2.1	4.0	2.3	1.3	2.1
Female	0	0.4	0.7	0.5	0.1	0.1
I-IIIA	-99	87.9	79.0	82.1	91.7	90.0
I-IIIA	-10	84.1	76.6	77.7	87.4	86.4
I-IIIA	-4	56.6	54.7	54.0	57.2	58.2
I-IIIA	-2	30.7	31.0	29.4	29.9	32.6
I-IIIA	-1	13.8	14.6	13.4	13.3	14.4
I-IIIA	0	0.8	1.3	1.2	0.7	0.7
IIIB	-99	90.7	91.4	90.0	92.2	86.7
IIIB	-10	76.0	77.0	77.9	73.5	71.1
IIIB	-4	14.0	11.9	11.9	16.8	20.8
IIIB	-2	3.5	1.9	3.1	4.5	5.4
IIIB	-1	1.7	1.6	1.7	1.7	2.0
IIIB	0	0.2	0.0	0.2	0.1	0.2
IV	-99	28.9	28.3	25.2	41.0	41.6
IV	-10	20.4	21.7	18.3	26.0	25.3
IV	-4	6.4	8.0	6.5	5.2	2.2
IV	-2	0.7	0.0	0.7	1.5	0.5
IV	-1	0.0	0.0	0.0	0.1	0.0
IV	0	0.0	0.0	0.0	0.0	0.0
HSDG	-99	90.4	88.3	87.7	92.4	91.8
HSDG	-10	81.9	81.2	77.1	83.3	87.2
HSDG	-4	42.5	40.8	29.9	46.2	56.6
HSDG	-2	21.8	21.2	14.0	23.3	31.4
HSDG	-1	8.8	9.7	6.1	8.9	12.2
HSDG	0	0.7	0.8	0.7	0.7	0.8
Senior	-99	80.4	68.3	68.4	87.4	87.3
Senior	-10	75.0	63.9	64.4	80.3	81.9
Senior	-4	37.5	31.9	25.9	38.1	49.4
Senior	-2	19.9	14.7	13.3	19.0	28.6
Senior	-1	9.1	8.1	7.2	8.2	12.3
Senior	0	0.7	0.6	0.9	0.5	0.6
Non-Grad	-99	79.2	68.6	68.9	88.1	87.6
Non-Grad	-10	73.4	62.4	63.2	81.2	84.6
Non-Grad	-4	43.9	35.5	32.3	50.1	59.8
Non-Grad	-2	22.0	19.1	15.9	24.6	30.5
Non-Grad	-1	11.7	9.6	7.3	13.6	17.7
Non-Grad	0	0.4	0.8	0.3	0.2	0.4

Table C4. Size of REQUEST-EOG Intersection as Percentage of the REQUEST List by Number of Opportunities, Subgroup, and Limit Value for IRB=4.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	-99	75.6	68.5	68.2	80.1	81.8
Overall	-10	70.5	65.1	61.8	74.9	77.6
Overall	-4	39.7	36.9	29.9	42.5	49.7
Overall	-2	18.5	18.2	13.3	19.6	24.0
Overall	-1	9.4	10.5	7.3	9.4	11.6
Overall	0	0.5	0.6	0.5	0.4	0.5
Male	-99	80.7	74.6	75.4	83.9	83.9
Male	-10	77.0	72.0	70.7	80.0	81.2
Male	-4	45.0	42.0	34.7	47.3	53.9
Male	-2	21.6	21.8	16.4	22.2	26.6
Male	-1	11.0	12.5	9.1	10.8	12.9
Male	0	0.5	0.5	0.5	0.4	0.5
Female	-99	58.2	52.6	52.6	62.6	70.4
Female	-10	48.2	47.1	42.4	51.6	58.4
Female	-4	21.3	23.6	19.6	20.3	26.3
Female	-2	7.6	8.6	6.7	7.4	10.0
Female	-1	3.7	5.4	3.6	2.9	4.5
Female	0	0.4	0.9	0.5	0.2	0.2
I-IIIA	-99	81.7	71.6	77.0	85.3	84.2
I-IIIA	-10	78.4	69.8	73.3	81.8	80.8
I-IIIA	-4	53.6	52.7	51.0	54.1	55.4
I-IIIA	-2	25.9	27.6	24.0	25.7	27.3
I-IIIA	-1	13.0	15.9	13.2	12.2	13.1
I-IIIA	0	0.6	0.9	0.8	0.5	0.5
IIIB	-99	67.3	69.2	65.0	69.3	68.6
IIIB	-10	58.4	63.2	55.4	60.2	59.3
IIIB	-4	10.1	9.4	8.1	11.6	14.3
IIIB	-2	2.4	1.4	2.0	3.0	3.2
IIIB	-1	1.5	1.0	1.2	1.9	2.0
IIIB	0	0.2	0.2	0.2	0.2	0.2
IV	-99	18.9	17.9	14.9	27.7	18.4
IV	-10	9.1	9.6	7.6	12.2	7.9
IV	-4	1.7	3.2	1.6	1.2	0.2
IV	-2	0.1	0.0	0.1	0.2	0.1
IV	-1	0.1	0.0	0.1	0.1	0.1
IV	0	0.0	0.0	0.0	0.0	0.1
HSDG	-99	81.8	78.4	76.6	84.5	86.7
HSDG	-10	74.8	72.7	67.4	78.0	81.6
HSDG	-4	40.3	38.2	30.2	43.6	51.3
HSDG	-2	17.1	17.9	12.1	18.2	22.4
HSDG	-1	8.2	10.2	6.7	8.0	10.0
HSDG	0	0.4	0.8	0.5	0.4	0.3
Senior	-99	63.7	48.2	46.8	70.8	75.4
Senior	-10	61.4	47.9	46.0	67.6	72.2
Senior	-4	34.9	28.4	23.9	36.5	45.8
Senior	-2	18.0	14.3	13.1	18.3	23.7
Senior	-1	9.2	8.1	7.6	8.7	11.9
Senior	0	0.8	0.9	0.8	0.7	0.9
Non-Grad	-99	72.9	64.5	65.7	79.8	77.8
Non-Grad	-10	69.9	63.3	62.5	76.2	74.8
Non-Grad	-4	45.3	41.7	38.2	48.9	52.6
Non-Grad	-2	24.6	22.4	18.5	26.9	31.7
Non-Grad	-1	14.1	13.4	9.8	15.9	17.5
Non-Grad	0	0.1	0.0	0.1	0.0	0.1

Appendix D

Mean Percent of Priority MOS in the Top of REQUEST and EER Job Lists

Table D1. Mean Percent of Priority MOS at the Top of REQUEST (REQ) and EER Job Lists Relative to Size of Intersection by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=1

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	**Limit**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**
Overall	0	0.2	99	95	0.0	100	100	0.1	99	98	0.2	99	94	0.5	99	96
	1	2.4	90	64	0.1	78	78	0.5	81	70	2.6	92	62	5.1	92	64
	2	5.7	86	61	0.2	73	73	1.0	76	66	6.5	87	59	12.1	90	62
	4	10.3	74	57	0.4	69	69	1.6	70	61	11.8	74	53	21.7	79	57
	10	16.8	56	50	0.8	57	57	3.2	58	54	19.9	54	46	34.0	58	49
	99	18.3	53	49	0.8	56	56	3.7	55	53	21.9	49	45	36.6	55	48
Male	0	0.3	99	95	0.0	100	100	0.1	100	99	0.2	99	94	0.5	99	96
	1	2.8	91	65	0.2	84	84	0.6	85	75	3.0	92	63	5.7	92	64
	2	6.5	88	65	0.3	79	79	1.1	80	72	7.2	90	61	12.9	91	64
	4	11.5	78	62	0.5	73	73	1.8	76	68	13.0	78	58	23.0	81	61
	10	18.0	62	56	0.8	64	64	3.3	66	63	20.9	59	51	34.9	62	53
	99	19.2	59	55	0.8	63	63	3.6	65	62	22.5	55	50	36.8	59	52
Female	0	0.0	97	95	0.0	100	100	0.0	80	90	0.0	100	91	0.1	100	98
	1	0.6	83	50	0.1	31	31	0.2	54	35	0.6	89	54	1.5	94	54
	2	2.3	67	38	0.1	30	30	0.4	52	37	2.9	70	39	6.7	75	39
	4	5.0	53	30	0.3	37	37	1.1	43	31	6.3	54	29	13.5	63	31
	10	11.4	30	24	0.7	26	26	3.0	32	27	15.2	27	19	28.7	35	24
	99	14.2	26	23	0.7	25	25	3.9	28	27	18.9	22	19	35.4	29	23
I-IIIA	0	0.3	99	99	0.0	100	100	0.2	99	100	0.2	99	98	0.5	99	99
	1	3.0	90	65	0.2	79	79	0.8	82	72	3.0	92	63	5.3	92	65
	2	6.9	86	62	0.3	75	75	1.5	77	67	7.3	86	58	12.2	90	62
	4	12.6	74	57	0.6	70	70	2.3	70	62	13.6	72	52	22.0	78	57
	10	19.8	57	50	0.8	63	63	3.2	63	59	21.7	52	44	34.3	58	49
	99	21.3	54	49	0.8	62	62	3.3	61	58	23.4	48	43	36.9	55	48
IIIB	0	0.1	98	50	0.0			0.0	91	91	0.1	99	51	0.3	99	37
	1	0.9	89	55	0.0	72	72	0.2	71	60	1.2	93	57	3.9	96	41
	2	2.7	85	59	0.1	61	61	0.4	72	63	4.1	91	59	11.8	89	53
	4	4.7	77	58	0.2	63	63	1.1	67	56	7.0	84	58	19.6	80	56
	10	9.9	53	48	0.8	43	43	3.5	49	46	15.5	59	51	31.7	60	48
	99	11.7	49	47	0.9	44	44	4.5	47	46	18.5	52	49	34.5	55	48
IV	0	0.0	100	36	0.0			0.0	100	50	0.1	100	33	0.2	100	0
	1	0.4	99	59	0.0			0.1	100	80	1.1	99	52	0.9	100	20
	2	0.8	93	71	0.0	0	0	0.2	97	88	2.7	93	66	2.5	90	70
	4	1.1	93	71	0.0	50	50	0.3	97	84	3.1	94	64	3.8	93	80
	10	3.7	65	61	0.3	43	43	1.9	69	66	9.5	65	60	7.3	78	60
	99	4.3	59	58	0.4	43	43	2.4	64	63	10.7	58	58	7.3	78	60
HSDG	0	0.3	99	96	0.0	100	100	0.1	97	96	0.3	99	94	0.6	99	98
	1	2.0	90	65	0.1	79	79	0.3	81	68	2.2	91	65	4.1	92	65
	2	5.2	87	61	0.2	69	69	0.8	76	65	5.9	89	60	10.6	90	61
	4	10.2	75	57	0.4	64	64	1.5	67	56	11.6	77	56	20.8	78	57
	10	17.1	55	49	0.8	52	52	3.5	53	50	19.9	55	47	32.9	57	48
	99	19.0	51	47	0.9	51	51	4.3	50	49	22.3	50	46	36.2	52	47
Senior	0	0.2	99	90	0.0	100	100	0.2	100	100	0.1	98	84	0.4	99	89
	1	3.3	89	67	0.1	63	63	0.7	74	66	2.7	90	65	6.6	92	69
	2	7.0	84	60	0.2	64	64	1.1	73	64	6.0	83	57	14.1	89	62
	4	11.8	75	55	0.3	49	49	1.8	66	58	10.4	73	51	23.6	83	59
	10	19.1	58	50	0.5	40	40	3.1	57	52	18.4	53	46	36.6	64	53
	99	20.5	55	49	0.6	38	38	3.3	56	52	20.1	49	44	39.1	61	53
Non-Grad	0	0.1	99	98	0.0	100	100	0.1	100	100	0.1	99	98	0.3	99	97
	1	2.6	92	59	0.2	80	80	0.7	84	74	3.6	94	55	6.3	94	54
	2	5.8	84	62	0.3	80	80	1.2	78	70	8.4	85	56	14.1	89	62
	4	9.3	73	59	0.5	78	78	1.9	76	70	13.6	68	48	22.2	76	54
	10	14.3	59	53	0.7	70	70	2.6	69	65	21.3	49	42	34.1	55	48
	99	14.7	58	53	0.7	71	71	2.8	68	65	22.1	47	41	34.7	55	47

Table D2. Mean Percent of Priority MOS at the Top of REQUEST (REQ) and EER Job Lists Relative to Size of Intersection by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=2

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	Limit	Size	REQ	EER	Size	REQ	EER	Size	REQ	EER	Size	REQ	EER	Size	REQ	EER
Overall	0	0.2	98	93	0.0	94	94	0.1	97	98	0.1	99	91	0.3	98	93
	1	2.3	85	68	0.1	72	72	0.4	79	73	2.3	86	66	5.5	87	68
	2	5.5	83	65	0.2	68	68	0.7	75	69	5.7	84	63	12.7	87	65
	4	10.5	72	57	0.4	60	60	1.5	69	61	11.5	72	54	23.3	77	59
	10	17.1	58	53	0.7	55	55	3.3	62	59	20.0	55	49	35.4	61	53
	99	18.3	56	53	0.8	55	55	3.7	61	59	21.6	52	48	37.3	58	52
Male	0	0.2	98	93	0.0	94	94	0.1	97	98	0.2	99	91	0.4	98	93
	1	2.8	85	69	0.1	75	75	0.5	83	78	2.8	85	66	6.1	86	69
	2	6.3	85	67	0.3	71	71	0.9	79	74	6.5	85	66	13.5	87	67
	4	11.8	76	62	0.5	64	64	1.7	75	69	12.6	76	60	24.3	79	62
	10	18.5	64	59	0.7	62	62	3.4	70	68	21.1	61	55	36.0	64	57
	99	19.5	63	59	0.8	62	62	3.6	70	68	22.5	58	54	37.5	62	56
Female	0	0.0	99	91	0.0	100	100	0.0	90	100	0.0	100	97	0.1	98	83
	1	0.5	88	58	0.0	44	44	0.1	59	45	0.5	93	62	1.4	94	58
	2	2.2	70	45	0.1	43	43	0.3	55	45	2.7	71	44	7.0	79	47
	4	5.6	53	32	0.3	35	35	1.1	49	37	7.0	54	28	16.4	61	33
	10	11.7	34	28	0.7	30	30	3.2	38	34	15.4	29	22	31.2	37	28
	99	13.6	31	28	0.7	29	29	3.8	36	33	18.2	26	22	35.8	33	27
I-IIIA	0	0.2	98	96	0.0	97	97	0.1	97	98	0.2	99	96	0.4	99	95
	1	3.2	85	69	0.2	73	73	0.7	81	75	3.1	85	68	5.8	87	69
	2	7.5	83	64	0.3	69	69	1.3	76	71	7.5	83	61	13.5	86	65
	4	13.9	72	57	0.6	61	61	2.3	71	64	14.6	70	52	24.4	77	58
	10	20.6	59	53	0.7	59	59	3.2	66	62	22.0	53	47	36.0	60	53
	99	21.5	57	52	0.8	58	58	3.4	65	62	23.1	51	46	37.5	59	52
IIIB	0	0.0	98	53	0.0	0	0	0.0	100	100	0.0	99	52	0.2	97	45
	1	0.4	83	52	0.0	45	45	0.1	67	56	0.6	87	53	1.7	86	47
	2	1.2	84	68	0.0	46	46	0.2	69	57	1.8	88	71	5.2	88	68
	4	3.1	75	57	0.2	52	52	0.8	62	51	4.6	82	60	12.3	83	63
	10	10.3	57	53	0.8	49	49	4.0	56	54	16.2	59	53	30.1	62	54
	99	12.2	54	53	0.9	48	48	4.6	55	54	19.2	54	52	35.7	56	52
IV	0	0.0	98	47	0.0			0.0	100	100	0.1	97	27	0.1	100	0
	1	0.1	95	60	0.0	100	100	0.0	100	100	0.2	93	41	0.1	100	0
	2	0.2	95	62	0.0	100	100	0.0	100	88	0.8	93	52	0.8	100	58
	4	0.6	84	73	0.1	100	100	0.3	87	76	1.9	78	64	1.0	100	67
	10	2.6	74	66	0.2	67	67	1.3	79	74	7.5	70	55	7.8	76	52
	99	3.7	66	66	0.3	63	63	1.6	75	75	10.7	57	57	15.8	48	48
HSDG	0	0.2	99	93	0.0	89	89	0.1	94	96	0.2	99	90	0.4	99	94
	1	2.1	85	67	0.1	67	67	0.3	75	70	2.0	86	66	4.5	86	67
	2	5.3	84	65	0.2	63	63	0.6	72	66	5.4	85	65	11.7	87	65
	4	10.7	72	57	0.4	52	52	1.4	66	59	11.3	74	55	22.6	77	58
	10	17.9	58	53	0.8	51	51	3.6	61	59	20.1	57	50	34.6	59	52
	99	19.4	55	52	0.9	49	49	4.1	59	58	22.2	53	50	36.9	57	52
Senior	0	0.1	99	87	0.0	100	100	0.0	100	100	0.1	100	85	0.3	99	85
	1	3.0	83	69	0.1	55	55	0.4	79	70	2.4	82	68	6.8	86	70
	2	7.0	82	63	0.1	53	53	0.8	72	63	5.8	81	59	15.4	86	67
	4	11.6	74	56	0.3	37	37	1.4	65	53	10.4	73	52	24.9	81	61
	10	19.0	57	50	0.6	37	37	3.2	55	50	19.0	53	47	37.8	65	55
	99	19.9	55	49	0.7	36	36	3.3	54	49	20.1	51	46	39.6	63	55
Non-Grad	0	0.1	97	99	0.0	100	100	0.1	100	100	0.1	96	98	0.3	97	99
	1	2.5	87	69	0.2	78	78	0.6	85	77	3.3	87	65	6.8	89	66
	2	4.7	83	65	0.3	76	76	1.0	80	76	6.6	82	59	12.3	88	61
	4	9.0	72	60	0.5	74	74	1.9	76	69	13.0	65	50	23.5	74	56
	10	13.7	61	56	0.7	69	69	2.9	69	66	20.4	51	45	34.5	58	51
	99	14.2	60	56	0.7	70	70	3.0	69	66	21.5	49	45	35.5	57	51

Table D3. Mean Percent of Priority MOS at the Top of REQUEST (REQ) and EER Job Lists Relative to Size of Intersection by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=3

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	**Limit**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**	**Size**	**REQ**	**EER**
Overall	0	0.1	97	94	0.0	100	100	0.0	95	89	0.1	96	93	0.3	98	95
	1	2.2	84	67	0.1	76	76	0.3	83	73	2.5	85	65	5.8	85	68
	2	5.1	81	61	0.2	67	67	0.7	78	65	5.6	82	59	13.1	83	61
	4	9.5	72	56	0.4	59	59	1.4	70	60	10.9	74	54	23.7	74	56
	10	15.8	58	52	0.7	59	59	3.5	60	55	18.7	56	49	36.5	58	51
	99	16.9	55	51	0.8	58	58	3.9	57	54	20.4	52	48	38.4	56	50
Male	0	0.1	98	95	0.0	100	100	0.0	98	95	0.1	97	94	0.3	99	96
	1	2.8	85	69	0.1	77	77	0.4	86	76	2.9	85	67	6.7	85	69
	2	6.1	82	63	0.2	69	69	0.9	80	68	6.4	82	61	14.7	83	64
	4	10.8	75	60	0.4	64	64	1.6	74	65	12.0	76	59	25.4	77	60
	10	17.2	63	58	0.7	64	64	3.8	68	64	19.7	61	54	37.7	62	55
	99	18.1	61	57	0.8	64	64	4.1	66	64	21.0	57	54	38.9	60	55
Female	0	0.0	88	75	0.0	100	100	0.0	87	74	0.0	85	67	0.1	91	78
	1	0.3	81	43	0.0	61	61	0.1	63	51	0.3	87	36	0.8	87	43
	2	1.3	76	42	0.1	52	52	0.2	66	52	1.7	78	37	4.5	81	41
	4	4.5	58	34	0.3	39	39	0.9	54	41	5.9	61	29	14.3	63	32
	10	10.4	37	27	0.7	38	38	2.8	40	31	14.1	33	21	30.3	38	26
	99	12.5	31	27	0.7	37	37	3.5	34	30	17.6	26	21	35.5	32	26
I-IIIA	0	0.2	98	97	0.0	100	100	0.1	97	94	0.2	97	97	0.3	98	97
	1	3.3	84	68	0.1	78	78	0.6	85	75	3.3	85	67	6.2	84	68
	2	7.4	80	61	0.3	68	68	1.4	77	65	7.3	81	58	14.1	82	61
	4	13.4	71	55	0.5	61	61	2.5	68	59	13.9	71	52	25.0	74	55
	10	20.1	57	51	0.8	60	60	3.8	60	54	21.0	54	47	37.2	58	50
	99	21.0	55	51	0.8	59	59	4.0	59	54	21.9	52	47	38.7	56	50
IIIB	0	0.0	93	41	0.0			0.0	88	72	0.0	94	28	0.1	97	24
	1	0.2	82	48	0.0	31	31	0.1	77	65	0.4	85	40	0.8	92	45
	2	0.5	86	67	0.0	27	27	0.2	81	69	1.0	89	68	2.3	91	66
	4	1.9	80	62	0.1	45	45	0.6	73	61	3.3	86	64	8.8	87	63
	10	8.2	60	55	0.8	56	56	3.9	59	56	13.8	61	53	29.5	65	54
	99	10.1	55	53	0.9	55	55	4.6	56	55	17.4	52	50	35.6	56	50
IV	0	0.0			0.0			0.0			0.0			0.0		
	1	0.0	100	50	0.0			0.0			0.0	100	50	0.0		
	2	0.1	91	16	0.0			0.0	92	10	0.2	91	23	0.2	100	0
	4	0.4	74	57	0.1	65	65	0.3	77	60	0.9	71	44	0.8	89	44
	10	1.6	68	49	0.2	65	65	1.0	69	53	4.4	67	36	9.1	84	43
	99	2.4	54	54	0.3	63	63	1.4	57	57	7.0	43	42	14.6	53	49
HSDG	0	0.1	97	94	0.0	100	100	0.0	97	90	0.2	96	93	0.3	98	96
	1	1.9	85	67	0.1	75	75	0.3	84	75	2.2	86	65	5.0	85	67
	2	4.9	80	61	0.2	57	57	0.7	76	64	5.6	82	60	12.9	81	61
	4	9.2	72	55	0.4	52	52	1.4	69	59	10.9	75	54	23.1	74	54
	10	15.5	58	51	0.8	54	54	3.7	60	55	18.7	57	49	35.6	57	50
	99	16.7	54	51	0.9	53	53	4.3	57	54	20.5	52	48	37.4	54	49
Senior	0	0.1	97	94	0.0	100	100	0.1	88	84	0.1	96	93	0.3	99	95
	1	2.7	84	67	0.1	79	79	0.4	78	72	2.1	83	65	6.2	86	67
	2	6.0	82	63	0.1	74	74	0.7	73	66	4.9	81	60	14.0	84	65
	4	10.8	76	60	0.3	62	62	1.3	69	60	9.5	77	58	24.2	79	61
	10	19.2	59	51	0.6	57	57	3.4	57	52	18.8	56	48	39.6	63	53
	99	20.5	56	51	0.7	56	56	3.6	55	52	20.4	52	48	42.1	60	53
Non-Grad	0	0.0	99	96	0.0	100	100	0.0	100	94	0.1	99	97	0.2	100	94
	1	2.6	84	67	0.1	76	76	0.4	85	69	3.3	84	65	7.3	83	69
	2	4.5	83	59	0.2	82	82	0.8	82	67	6.0	82	55	12.4	84	55
	4	9.0	69	55	0.4	70	70	1.6	72	60	11.9	69	51	24.3	69	52
	10	13.7	58	53	0.6	68	68	3.2	62	57	18.6	55	49	34.3	55	49
	99	14.5	56	52	0.7	68	68	3.5	61	56	20.0	51	47	35.5	54	48

Table D4. Mean Percent of Priority MOS at the Top of REQUEST (REQ) and EER Job Lists Relative to Size of Intersection by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=4

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	Limit	Size	REQ	EER	Size	REQ	EER	Size	REQ	EER	Size	REQ	EER	Size	REQ	EER
Overall	0	0.1	94	91	0.0	86	86	0.0	55	61	0.1	96	92	0.2	98	96
	1	2.0	84	75	0.1	69	69	0.3	70	67	2.4	85	73	4.8	89	80
	2	4.2	78	69	0.2	61	61	0.6	65	60	4.9	79	67	10.0	84	75
	4	8.8	66	59	0.4	58	58	1.4	59	54	10.5	66	58	20.5	71	66
	10	14.5	50	48	0.7	56	56	2.9	54	51	18.1	46	44	31.8	52	51
	99	15.4	48	47	0.7	55	55	3.3	52	51	19.3	43	42	33.5	50	49
Male	0	0.1	96	92	0.0	77	77	0.0	64	65	0.1	97	92	0.2	98	96
	1	2.4	85	75	0.1	69	69	0.4	73	68	2.7	85	73	5.4	88	80
	2	5.0	79	70	0.2	62	62	0.8	68	63	5.6	80	69	11.1	84	76
	4	10.4	68	62	0.4	60	60	1.6	64	59	11.9	69	61	22.3	72	67
	10	16.5	54	53	0.7	61	61	3.3	61	60	19.6	49	47	33.4	55	54
	99	17.2	53	52	0.7	61	61	3.5	61	60	20.5	47	46	34.5	53	52
Female	0	0.0	80	82	0.0	100	100	0.0	42	55	0.1	87	86	0.1	100	99
	1	0.5	79	75	0.1	69	69	0.2	59	62	0.6	80	75	1.8	92	86
	2	1.2	68	58	0.1	56	56	0.3	56	49	1.6	69	56	4.0	82	70
	4	3.2	53	45	0.2	46	46	1.0	47	38	4.4	52	43	10.5	67	58
	10	7.7	33	28	0.5	36	36	2.2	33	28	11.1	29	24	23.2	38	33
	99	9.3	29	26	0.5	35	35	2.7	29	26	13.5	26	22	27.8	34	30
I-IIIA	0	0.1	95	93	0.0	85	85	0.0	63	70	0.1	97	93	0.2	98	96
	1	2.8	84	75	0.2	69	69	0.6	69	67	3.1	85	72	5.4	88	80
	2	5.9	77	68	0.3	61	61	1.1	64	60	6.5	78	67	11.3	83	75
	4	12.1	64	58	0.5	59	59	2.4	58	53	13.5	63	55	22.8	69	64
	10	17.8	49	48	0.7	57	57	3.5	51	49	20.2	46	44	33.2	52	51
	99	18.6	48	47	0.7	57	57	3.7	50	48	21.0	44	43	34.5	50	49
IIIB	0	0.0	82	77	0.0	100	100	0.0	28	26	0.0	88	83	0.1	99	92
	1	0.3	85	75	0.0	64	64	0.1	75	64	0.4	86	77	0.9	92	84
	2	0.4	83	74	0.0	56	56	0.1	74	62	0.7	85	76	1.3	92	84
	4	1.7	79	69	0.1	48	48	0.4	65	55	2.7	83	73	5.9	89	79
	10	8.0	52	49	0.6	53	53	2.6	57	55	13.2	46	42	24.0	54	49
	99	9.3	49	47	0.7	51	51	3.0	55	54	15.3	42	39	27.4	50	47
IV	0	0.0	100	100	0.0			0.0			0.0			0.0	100	100
	1	0.0	100	50	0.0			0.0	100	25	0.0	100	60	0.0	100	100
	2	0.0	100	50	0.0			0.0	100	25	0.0	100	60	0.0	100	100
	4	0.1	78	60	0.0	100	100	0.1	71	41	0.2	76	67	0.1	100	67
	10	1.0	73	64	0.1	80	80	0.4	67	56	2.5	77	68	3.0	70	70
	99	2.1	51	50	0.2	64	64	0.8	57	56	5.6	42	39	6.9	43	42
HSDG	0	0.1	96	90	0.0	93	93	0.0	70	79	0.1	98	89	0.1	99	94
	1	1.6	86	71	0.1	64	64	0.3	73	68	1.9	88	69	4.0	90	77
	2	3.6	79	65	0.2	52	52	0.6	65	58	4.4	81	64	8.9	85	73
	4	8.4	65	56	0.4	49	49	1.5	58	51	10.4	68	56	20.3	71	64
	10	14.3	50	47	0.7	48	48	3.2	52	50	18.1	47	44	32.2	52	50
	99	15.4	47	46	0.8	48	48	3.7	50	49	19.5	44	42	34.1	50	48
Senior	0	0.2	93	93	0.0	71	71	0.0	37	37	0.2	95	95	0.4	97	97
	1	2.4	82	82	0.1	52	52	0.3	60	60	2.3	83	83	5.2	88	88
	2	4.8	76	76	0.1	52	52	0.6	61	61	5.0	76	76	10.5	82	82
	4	9.4	66	66	0.3	51	51	1.1	58	58	9.8	66	66	20.2	71	71
	10	15.7	49	49	0.5	55	55	2.1	54	54	17.6	43	43	31.7	52	52
	99	16.3	48	48	0.5	56	56	2.2	54	54	18.4	42	42	33.1	51	50
Non-Grad	0	0.0	90	83	0.0			0.0	0	0	0.0	88	81	0.0	99	92
	1	3.0	81	72	0.1	88	88	0.4	73	69	4.1	78	69	7.3	86	76
	2	5.1	75	68	0.2	84	84	0.8	69	65	6.8	73	64	13.2	80	70
	4	9.0	66	61	0.4	81	81	1.7	65	60	12.3	62	56	21.7	68	61
	10	13.4	54	52	0.6	77	77	2.9	58	56	19.0	45	43	30.6	54	51
	99	13.9	54	52	0.6	77	77	3.0	58	56	19.8	44	42	31.8	53	50

Appendix E

Mean Percent Rank of Included, Excluded, and Additional Opportunities

Table E1. Mean Percent Rank of Included (Inc), Excluded (Exc), and Additional (Add) Opportunities in the REQUEST-EOG Intersection by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=1

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	**Limit**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**
Overall	-99	49.6	56.7	35.6	50.0		50.0	50.2	50.8	45.2	49.4	56.8	34.3	49.1	57.7	33.7
	-10	50.9	49.5	45.3	50.0		50.0	51.2	47.8	50.3	51.2	49.5	44.4	50.7	50.0	43.3
	-4	54.9	45.9	52.3	50.0		50.0	52.2	48.5	52.4	56.4	45.5	52.9	55.4	45.7	51.7
	-2	56.7	47.1	56.0	50.0		50.0	52.5	49.0	52.6	58.1	46.9	56.9	57.6	47.0	56.1
	-1	57.2	48.9	57.0	50.0		50.0	52.3	49.3	52.3	58.1	48.8	57.7	58.1	48.9	57.6
	0	56.9	49.9	56.9	50.0		50.0	51.7	53.6	51.7	57.3	49.6	57.3	57.6	49.7	57.6
Male	-99	49.6	57.4	36.2	50.0		50.0	50.3	51.8	47.7	49.4	58.1	34.9	49.2	57.5	34.9
	-10	50.6	50.6	44.7	50.0		50.0	51.0	50.0	50.4	50.8	50.7	43.8	50.3	50.5	42.9
	-4	53.6	46.1	50.8	50.0		50.0	51.6	49.2	51.0	54.6	45.7	51.1	54.2	45.7	50.4
	-2	55.7	47.1	55.1	50.0		50.0	52.3	48.9	52.0	56.8	46.9	55.8	56.4	47.0	55.2
	-1	56.2	48.9	56.0	50.0		50.0	52.3	49.1	52.0	56.7	48.9	56.4	57.0	48.9	56.8
	0	56.3	49.9	56.3	50.0		50.0	52.8	53.0	52.8	56.9	49.7	56.9	56.5	49.7	56.5
Female	-99	49.5	54.0	33.7	50.0		50.0	50.0	49.2	42.4	49.5	52.6	32.3	48.5	59.0	27.1
	-10	52.5	45.4	47.8	50.0		50.0	51.7	44.6	50.1	53.4	44.9	47.0	53.3	47.0	45.6
	-4	61.7	45.4	60.4	50.0		50.0	54.8	46.9	56.3	65.4	44.7	62.7	64.0	45.5	60.4
	-2	64.3	47.2	63.2	50.0		50.0	53.6	49.2	55.2	67.7	46.7	65.2	67.6	46.9	64.6
	-1	68.0	48.5	67.2	50.0		50.0	52.1	50.0	54.1	72.2	48.1	71.7	71.6	48.3	68.9
	0	75.1	50.7	75.1	50.0		50.0	34.9	61.2	34.9	74.4	48.9	74.4	85.6	49.1	85.6
I-IIIA	-99	49.6	55.9	35.1	50.0		50.0	50.4	50.3	39.3	49.5	55.4	34.9	49.3	57.2	34.8
	-10	50.9	48.8	44.7	50.0		50.0	50.8	48.3	50.0	51.2	48.3	44.3	50.9	49.4	43.8
	-4	54.9	45.8	52.5	50.0		50.0	51.3	49.5	51.5	56.5	45.3	53.2	55.5	45.6	52.0
	-2	56.4	47.2	56.2	50.0		50.0	51.2	49.1	51.1	57.7	46.9	57.1	57.5	47.1	56.3
	-1	56.5	49.0	56.3	50.0		50.0	51.2	49.5	50.7	57.0	49.0	56.7	57.8	49.0	57.4
	0	56.4	49.9	56.4	50.0		50.0	52.0	53.5	52.0	56.3	49.7	56.3	57.3	49.7	57.3
IIIB	-99	49.4	61.9	36.6	50.0		50.0	50.0	51.0	47.0	48.9	65.3	32.4	47.7	65.3	21.2
	-10	50.8	54.3	46.3	50.0		50.0	51.1	47.2	50.0	51.1	56.5	44.4	48.8	58.4	37.0
	-4	54.4	46.9	51.2	50.0		50.0	53.9	47.4	54.1	55.4	46.8	51.2	53.9	46.4	46.9
	-2	58.3	47.2	55.5	50.0		50.0	55.6	48.9	56.4	59.8	47.1	56.0	58.9	45.7	54.0
	-1	62.3	47.8	62.2	50.0		50.0	55.2	48.9	56.3	64.5	47.7	64.4	64.1	47.3	63.6
	0	63.9	49.9	63.9	41.3	56.6	41.3	65.8	49.2	65.8	65.9	49.6	65.9	0.0	0.0	0.0
IV	-99	49.9	62.7	40.1	50.0		50.0	49.9	62.0	45.9	49.7	63.9	33.5	49.3	50.7	0.0
	-10	53.3	46.9	50.5	50.0		50.0	54.8	47.1	53.7	52.6	46.7	46.9	49.3	50.7	33.6
	-4	57.3	45.0	53.0	50.0		50.0	55.8	47.4	48.6	58.7	43.6	57.6	53.9	45.8	33.4
	-2	59.8	44.3	53.8	50.0		50.0	63.3	45.9	58.3	58.7	43.8	52.6	64.2	39.7	68.0
	-1	61.9	47.6	60.9	64.8	47.6	63.4	61.0	47.6	60.2	55.6	47.9	56.9	0.0	0.0	0.0
	0	71.5	48.4	71.5	71.0	47.7	71.0	74.0	48.6	74.0	50.0	50.0	50.0	0.0	0.0	0.0
HSDG	-99	49.6	57.2	35.9	50.0		50.0	50.4	49.1	44.6	49.4	57.8	34.3	49.2	58.0	34.2
	-10	51.3	48.8	45.7	50.0		50.0	52.0	45.2	51.3	51.5	49.2	44.5	51.0	49.3	43.4
	-4	55.4	45.9	52.8	50.0		50.0	52.8	48.4	51.9	56.8	45.6	53.4	55.6	45.4	52.3
	-2	57.2	47.2	55.4	50.0		50.0	54.3	48.3	53.9	58.3	47.0	55.9	57.4	47.1	55.3
	-1	58.4	48.7	57.8	50.0		50.0	54.4	49.0	54.6	59.3	48.6	58.5	58.8	48.8	57.9
	0	59.1	49.8	59.1	50.0		50.0	52.3	54.9	52.3	59.7	49.5	59.7	59.4	49.6	59.4
Senior	-99	49.4	57.0	32.0	50.0		50.0	49.7	52.1	47.9	49.4	57.6	31.9	49.2	57.6	29.7
	-10	50.9	48.1	45.9	50.0		50.0	49.8	50.4	48.2	51.7	47.9	46.4	51.0	47.9	44.4
	-4	55.5	46.7	52.7	50.0		50.0	51.8	48.2	54.8	57.1	46.5	54.3	56.0	46.5	51.2
	-2	57.3	47.2	57.4	50.0		50.0	50.1	49.8	50.5	58.7	47.1	58.8	58.8	46.7	57.5
	-1	57.7	49.1	58.3	50.0		50.0	49.8	49.2	48.1	58.7	49.2	59.4	59.2	48.9	59.3
	0	51.4	49.9	51.4	50.0		50.0	53.2	48.7	53.2	45.5	50.3	45.5	53.4	50.0	53.4
Non-Grad	-99	49.7	54.9	39.7	50.0		50.0	50.3	52.2	47.1	49.5	54.0	37.7	49.0	57.0	39.8
	-10	50.0	52.9	43.3	50.0		50.0	50.3	51.8	47.9	50.1	51.7	42.6	49.3	55.2	41.4
	-4	53.1	45.4	50.6	50.0		50.0	51.5	49.1	52.1	54.5	44.6	50.6	54.1	45.4	50.1
	-2	55.3	47.0	56.7	50.0		50.0	51.2	49.9	51.4	57.3	46.5	58.3	56.7	46.8	57.1
	-1	54.0	49.1	54.2	50.0		50.0	51.0	49.8	51.4	54.8	49.0	55.0	55.1	49.1	55.0
	0	48.7	51.0	48.7	50.0		50.0	49.5	58.4	49.5	46.5	50.0	46.5	50.4	49.8	50.4

Table E2. Mean Percent Rank of Included (Inc), Excluded (Exc), and Additional (Add) Opportunities in the REQUEST-EOG INTERSECTION by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=2

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	Limit	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add
Overall	-99	49.6	56.8	33.6	50.0		50.0	50.0	49.7	41.1	49.4	57.4	33.5	49.2	57.6	30.4
	-10	50.5	50.0	44.7	50.0		50.0	50.6	44.9	50.6	50.8	50.1	43.8	50.3	50.9	41.9
	-4	54.5	45.5	51.1	50.0		50.0	50.9	49.2	50.6	56.7	45.0	52.2	54.8	45.2	50.2
	-2	57.9	46.5	57.1	50.0		50.0	51.0	49.3	51.8	60.1	46.1	58.6	58.6	46.5	57.0
	-1	58.1	48.4	57.9	50.0		50.0	50.4	50.1	50.2	60.0	48.2	59.5	58.8	48.4	58.4
	0	59.8	49.7	59.8	50.0		50.0	52.7	51.3	52.7	61.6	49.4	61.6	59.7	49.7	59.7
Male	-99	49.5	57.3	34.2	50.0		50.0	49.9	52.7	45.8	49.5	57.7	34.4	49.2	57.5	31.2
	-10	50.2	51.1	44.4	50.0		50.0	50.2	49.8	50.1	50.5	51.1	43.9	50.0	51.3	41.9
	-4	53.3	45.7	49.5	50.0		50.0	50.1	50.2	49.2	54.8	45.3	50.1	53.7	45.4	49.0
	-2	57.0	46.6	56.3	50.0		50.0	50.9	49.2	51.6	59.0	46.1	57.6	57.6	46.6	56.1
	-1	56.9	48.4	56.7	50.0		50.0	50.3	50.2	49.9	58.5	48.2	58.1	57.4	48.5	57.1
	0	59.1	49.7	59.1	50.0		50.0	53.2	51.1	53.2	60.8	49.4	60.8	58.9	49.7	58.9
Female	-99	49.7	55.2	32.0	50.0		50.0	50.3	45.7	36.7	49.4	56.5	31.7	48.9	58.0	26.3
	-10	51.8	45.9	46.0	50.0		50.0	51.9	39.4	51.5	52.1	47.0	43.4	52.2	48.8	42.0
	-4	60.4	44.4	58.7	50.0		50.0	53.6	47.2	54.1	64.6	43.7	61.5	62.7	43.6	58.9
	-2	64.0	46.1	63.4	50.0		50.0	52.0	49.6	52.9	67.0	45.5	65.3	67.3	45.6	65.1
	-1	69.7	48.4	69.2	50.0		50.0	51.4	49.9	51.9	72.4	48.2	71.9	74.5	48.2	73.9
	0	72.4	49.3	72.4	50.0		50.0	43.8	53.6	43.8	72.9	48.8	72.9	76.9	49.2	76.9
I-IIIA	-99	49.4	56.9	30.3	50.0		50.0	49.6	53.3	32.2	49.4	57.1	29.6	49.2	57.2	30.5
	-10	50.3	50.1	42.7	50.0		50.0	50.1	48.0	49.0	50.6	49.7	42.1	50.3	50.7	41.7
	-4	54.3	45.2	50.9	50.0		50.0	50.8	49.6	50.8	56.3	44.5	51.9	54.7	45.0	50.1
	-2	57.3	46.4	57.0	50.0		50.0	50.5	49.6	51.6	59.2	45.9	58.1	58.5	46.5	57.1
	-1	57.3	48.6	57.1	50.0		50.0	49.6	50.8	49.2	58.7	48.4	58.3	58.2	48.5	57.9
	0	58.8	49.7	58.8	50.0		50.0	51.5	51.7	51.5	60.4	49.4	60.4	58.9	49.7	58.9
IIIB	-99	49.9	56.1	40.4	50.0		50.0	50.5	41.4	45.5	49.4	59.4	40.5	48.8	63.3	28.6
	-10	50.9	50.0	48.8	50.0		50.0	51.1	40.7	51.2	51.0	52.8	47.4	50.6	54.2	43.9
	-4	55.2	47.2	52.4	50.0		50.0	51.0	48.7	50.5	57.9	46.8	53.9	56.2	46.7	51.6
	-2	61.3	47.4	57.9	50.0		50.0	53.3	48.5	53.0	64.0	47.2	60.3	60.3	47.3	54.3
	-1	68.8	46.8	68.0	50.0		50.0	55.6	48.0	56.0	70.8	46.6	70.1	72.9	46.6	71.6
	0	73.4	49.0	73.4	50.0		50.0	59.0	49.7	59.0	72.6	48.9	72.6	78.4	49.0	78.4
IV	-99	49.9	59.7	42.4	50.0		50.0	49.9	60.2	40.0	49.8	59.0	42.7	49.6	74.5	48.5
	-10	53.0	44.4	52.2	50.0		50.0	53.1	39.9	53.0	53.6	46.2	51.6	51.7	52.2	49.3
	-4	54.6	45.9	43.2	50.0		50.0	50.8	47.7	46.3	59.0	44.7	39.6	63.2	38.3	7.8
	-2	72.0	44.0	73.9	50.0		56.7	63.2	45.3	76.5	75.5	43.8	79.1	77.1	33.8	0.0
	-1	67.1	45.9	65.3	50.0		50.0	66.8	43.1	63.4	68.6	47.1	67.3	54.7	49.8	0.0
	0	70.8	47.2	70.8	81.7	44.4	81.7	67.4	48.3	67.4	54.7	49.8	54.7	0.0	0.0	0.0
HSDG	-99	49.6	57.0	34.6	50.0		50.0	50.2	47.2	41.0	49.4	57.5	34.4	49.2	57.9	31.7
	-10	50.7	49.4	45.1	50.0		50.0	51.1	41.7	51.2	50.8	49.8	44.2	50.4	50.6	41.9
	-4	54.7	45.3	51.0	50.0		50.0	50.6	48.8	49.9	56.8	45.1	52.1	54.8	44.6	50.0
	-2	58.3	46.4	57.4	50.0		50.0	51.4	48.7	51.7	60.2	46.1	58.6	58.6	46.3	57.3
	-1	59.2	48.4	58.9	50.0		50.0	52.0	48.9	52.6	60.7	48.2	60.0	59.5	48.5	59.1
	0	60.2	49.7	60.2	50.0		50.0	52.2	52.2	52.2	62.4	49.4	62.4	59.7	49.7	59.7
Senior	-99	49.2	59.3	28.0	50.0		50.0	49.1	52.8	34.3	49.2	60.6	27.9	48.9	59.5	26.7
	-10	50.3	49.9	43.6	50.0		50.0	49.6	47.6	48.5	50.8	49.7	43.1	50.4	50.5	41.5
	-4	55.5	46.4	51.8	50.0		50.0	52.5	48.7	52.5	57.4	45.7	53.3	55.5	46.5	50.3
	-2	58.9	46.5	57.1	50.0		50.0	51.5	48.5	52.9	60.9	46.0	58.5	59.4	46.6	56.7
	-1	58.8	48.3	58.5	50.0		50.0	50.1	52.3	48.9	60.8	48.0	60.4	58.8	48.2	58.5
	0	60.5	49.7	60.5	50.0		50.0	54.8	53.0	54.8	64.8	49.0	64.8	59.1	49.7	59.1
Non-Grad	-99	49.9	53.8	37.5	50.0		50.0	50.3	51.5	48.1	49.9	54.3	36.4	49.5	54.0	27.7
	-10	50.3	51.9	44.5	50.0		50.0	50.3	50.9	50.2	50.7	51.6	43.0	50.0	52.4	42.5
	-4	53.0	45.2	51.0	50.0		50.0	50.4	50.8	50.8	55.4	44.0	51.3	54.1	45.1	50.8
	-2	55.9	47.0	56.5	50.0		50.0	50.3	50.9	51.5	59.0	45.9	58.7	57.6	47.2	56.4
	-1	54.7	48.7	54.7	50.0		50.0	48.8	51.0	48.1	57.2	48.4	57.1	56.0	48.6	55.8
	0	57.5	49.5	57.5	50.0		50.0	52.8	48.5	52.8	56.0	49.6	56.0	60.5	49.7	60.5

Table E3. Mean Percent Rank of Included (Inc), Excluded (Exc), and Additional (Add) Opportunities in the REQUEST-EOG INTERSECTION by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=3

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	**Limit**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**
Overall	-99	49.6	58.4	37.8	50.0		50.0	50.1	50.3	44.1	49.4	58.9	36.0	49.1	60.3	34.7
	-10	50.5	52.0	44.9	50.0		50.0	50.8	47.1	49.2	50.6	51.9	44.1	50.1	54.2	41.4
	-4	55.1	45.2	52.9	50.0		50.0	52.8	47.1	53.2	56.3	44.9	53.3	55.8	44.7	52.3
	-2	56.2	46.9	54.5	50.0		50.0	52.0	48.9	51.8	57.3	46.6	55.1	57.3	46.7	54.6
	-1	58.4	48.2	57.5	50.0		50.0	51.8	49.8	51.8	59.5	48.0	58.5	59.5	48.2	58.3
	0	63.6	49.5	63.6	50.0		50.0	51.5	50.5	51.5	62.8	49.4	62.8	66.2	49.5	66.2
Male	-99	49.6	59.0	38.9	50.0		50.0	50.1	51.8	46.4	49.5	59.6	37.0	49.3	59.9	36.5
	-10	50.2	53.2	44.8	50.0		50.0	50.5	49.2	49.3	50.3	53.1	44.1	49.8	54.5	41.7
	-4	53.9	45.6	51.3	50.0		50.0	51.9	48.1	51.5	55.1	45.3	51.9	54.1	45.2	50.5
	-2	55.2	47.0	53.1	50.0		50.0	52.0	48.9	51.5	56.4	46.7	54.0	55.5	46.9	52.7
	-1	57.5	48.3	56.5	50.0		50.0	52.4	49.6	52.0	58.7	48.0	57.5	58.0	48.3	56.7
	0	63.6	49.4	63.6	50.0		50.0	54.1	49.4	54.1	62.6	49.4	62.6	65.7	49.5	65.7
Female	-99	49.4	56.3	35.7	50.0		50.0	50.2	48.5	41.6	49.0	56.7	34.0	48.4	62.0	28.6
	-10	51.8	48.1	45.4	50.0		50.0	51.9	44.5	49.0	52.1	47.6	44.2	52.0	52.8	39.8
	-4	60.8	42.9	60.2	50.0		50.0	55.8	44.3	57.7	62.6	42.9	61.2	66.1	41.8	62.4
	-2	64.2	46.1	64.7	50.0		50.0	51.4	48.8	53.7	65.7	45.8	65.1	71.0	45.3	69.5
	-1	69.8	48.1	72.4	50.0		50.0	48.1	51.0	50.0	73.6	47.5	75.5	80.2	47.4	80.6
	0	62.6	50.8	62.6	50.0		50.0	44.6	53.4	44.6	66.3	49.6	66.3	79.7	49.2	79.7
I-IIIA	-99	49.4	59.5	34.3	50.0		50.0	49.7	54.3	36.0	49.3	59.5	32.9	49.1	60.5	34.9
	-10	50.2	53.5	42.3	50.0		50.0	50.4	48.7	45.4	50.4	53.3	42.2	50.0	54.9	40.8
	-4	55.3	44.7	53.0	50.0		50.0	53.1	46.0	54.1	56.5	44.5	53.6	55.9	44.6	52.3
	-2	55.8	46.9	54.0	50.0		50.0	51.8	49.1	50.9	56.5	46.6	54.4	57.0	46.7	54.4
	-1	58.1	48.3	57.1	50.0		50.0	52.5	49.7	52.0	58.8	48.2	57.6	59.3	48.2	58.0
	0	63.9	49.4	63.9	50.0		50.0	53.7	49.3	53.7	62.6	49.4	62.6	66.3	49.5	66.3
IIIB	-99	50.1	51.1	42.3	50.0		50.0	50.5	45.1	47.3	49.6	55.1	39.9	49.6	55.8	33.9
	-10	51.1	46.3	49.8	50.0		50.0	51.3	45.5	50.7	51.1	47.2	48.8	51.3	44.7	47.8
	-4	54.1	47.1	52.5	50.0		50.0	52.6	48.0	52.7	55.2	46.7	52.5	55.0	46.5	52.4
	-2	60.2	46.9	60.0	50.0		50.0	52.3	48.2	56.0	63.7	46.2	61.4	63.1	47.1	59.6
	-1	62.1	47.2	64.4	50.0		50.0	48.6	50.1	50.5	69.7	45.6	71.4	67.0	46.7	68.9
	0	58.1	50.9	58.1	44.2	54.3	44.2	65.7	49.3	65.7	60.4	49.5	60.4	0.0	0.0	0.0
IV	-99	50.0	49.1	44.9	50.0		50.0	50.1	31.5	47.8	49.9	55.5	41.2	50.3	50.8	32.8
	-10	52.2	44.6	55.5	50.0		50.0	51.2	46.4	55.4	54.8	43.1	56.9	55.3	40.9	55.8
	-4	44.9	61.9	41.4	50.0		50.0	43.7	63.6	40.5	45.1	58.9	37.9	43.4	52.0	45.3
	-2	60.5	47.7	59.4	58.9	47.7	58.9	63.4	47.7	61.1	36.8	50.7	36.8	0.0	0.0	0.0
	-1	87.3	46.1	87.3	87.3	46.1	87.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HSDG	-99	49.6	60.1	40.1	50.0		50.0	50.3	50.1	44.2	49.2	61.5	37.5	49.2	61.6	39.8
	-10	50.5	53.4	44.3	50.0		50.0	51.1	46.5	49.4	50.4	54.1	42.6	50.0	55.9	40.4
	-4	55.7	44.7	52.8	50.0		50.0	53.3	47.1	53.4	57.3	44.4	53.6	56.0	44.0	51.4
	-2	56.9	46.3	54.7	50.0		50.0	52.7	47.8	51.9	58.2	46.1	55.7	57.6	46.1	54.7
	-1	60.8	47.9	59.5	50.0		50.0	53.0	47.9	52.8	62.1	47.8	60.4	62.1	48.0	60.7
	0	63.5	49.4	63.5	50.0		50.0	53.0	49.4	53.0	64.4	49.3	64.4	64.4	49.5	64.4
Senior	-99	49.2	60.5	29.7	50.0		50.0	49.4	51.0	38.8	49.1	62.4	30.6	49.0	61.0	25.5
	-10	50.6	49.5	44.1	50.0		50.0	50.2	46.0	49.2	51.1	48.5	45.0	50.6	51.2	40.2
	-4	55.7	45.2	54.8	50.0		50.0	51.1	47.9	53.5	56.3	45.5	55.2	57.4	44.3	54.9
	-2	57.0	47.2	55.8	50.0		50.0	49.1	52.4	51.6	58.1	47.3	56.5	58.5	46.5	56.1
	-1	56.2	48.7	56.0	50.0		50.0	47.5	55.6	47.4	57.4	48.3	57.7	57.2	48.2	56.3
	0	67.9	49.6	67.9	50.0		50.0	46.4	53.6	46.4	65.3	49.7	65.3	71.8	49.2	71.8
Non-Grad	-99	49.9	53.0	40.8	50.0		50.0	50.2	50.2	47.0	49.9	52.2	38.4	49.3	55.8	32.2
	-10	50.5	51.1	47.0	50.0		50.0	50.7	49.4	48.6	50.8	50.0	46.5	49.7	54.2	45.7
	-4	53.3	46.2	51.5	50.0		50.0	52.6	46.6	52.7	54.2	45.5	51.7	53.0	47.3	50.6
	-2	54.2	47.8	52.8	50.0		50.0	52.0	49.3	51.8	55.1	47.1	53.3	54.8	48.6	52.6
	-1	54.3	48.8	54.2	50.0		50.0	52.1	51.3	52.0	55.0	48.3	55.1	54.7	49.0	54.2
	0	56.1	49.7	56.1	50.0		50.0	52.9	51.0	52.9	50.5	49.8	50.5	62.8	49.5	62.8

Table E4. Mean Percent Rank of Included (Inc), Excluded (Exc), and Additional (Add) Opportunities in the REQUEST-EOG INTERSECTION by Number of Opportunities in the Job List, Subgroup, and Limit Value for IRB=4

		Number of Opportunities														
		All			1			2-10			11-30			>=31		
Subgroup	**Limit**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**
Overall	-99	49.4	58.2	35.6	50.0		50.0	49.8	53.2	41.0	49.2	58.6	34.3	48.8	59.6	33.9
	-10	50.1	53.1	44.0	50.0		50.0	50.5	48.8	47.2	50.1	53.2	43.3	49.8	54.9	41.4
	-4	55.1	45.8	51.9	50.0		50.0	53.6	45.4	52.9	56.1	45.8	52.3	55.8	46.1	51.0
	-2	57.8	46.4	54.1	50.0		50.0	54.0	46.3	52.1	58.8	46.5	54.5	59.0	46.3	54.3
	-1	61.1	47.4	60.4	50.0		50.0	54.9	46.5	54.5	62.2	47.4	61.3	62.7	47.5	62.0
	0	68.3	49.1	68.3	50.0		50.0	58.9	46.5	58.9	69.9	49.1	69.9	68.5	49.4	68.5
Male	-99	49.5	58.2	37.0	50.0		50.0	50.2	50.9	44.1	49.3	58.7	35.1	49.1	59.3	36.6
	-10	49.9	54.2	44.2	50.0		50.0	50.4	48.8	48.7	49.8	54.2	43.3	49.5	55.9	41.7
	-4	53.7	46.3	50.2	50.0		50.0	51.2	46.8	49.7	54.9	46.0	51.0	54.0	46.6	49.2
	-2	56.9	46.4	53.2	50.0		50.0	52.9	46.3	51.3	58.0	46.5	53.6	57.9	46.4	53.2
	-1	60.3	47.5	59.6	50.0		50.0	53.5	46.9	52.9	61.4	47.5	60.5	61.7	47.6	61.1
	0	68.4	49.1	68.4	50.0		50.0	61.7	45.9	61.7	69.8	49.1	69.8	67.8	49.5	67.8
Female	-99	48.8	58.3	33.3	50.0		50.0	49.0	55.6	38.6	48.7	58.5	32.7	47.6	60.9	27.2
	-10	51.4	49.2	43.2	50.0		50.0	50.9	48.8	43.6	52.0	49.0	43.5	51.7	49.9	40.3
	-4	62.1	43.6	60.3	50.0		50.0	59.8	43.0	60.0	63.3	44.3	60.5	66.7	43.3	62.1
	-2	63.2	46.0	60.4	50.0		50.0	57.5	46.3	54.5	64.9	46.2	61.6	68.0	45.6	63.5
	-1	67.7	46.5	67.9	50.0		50.0	60.5	45.3	62.1	70.3	46.9	70.4	71.7	46.8	70.6
	0	67.5	48.8	67.5	50.0		50.0	54.5	47.4	54.5	70.4	49.4	70.4	76.6	49.3	76.6
I-IIIA	-99	49.1	59.9	32.4	50.0		50.0	49.3	56.4	35.6	49.1	60.3	31.2	48.8	60.4	32.6
	-10	50.0	54.6	41.5	50.0		50.0	50.1	51.4	43.3	50.0	54.7	41.1	49.8	55.3	40.5
	-4	55.8	45.3	52.1	50.0		50.0	53.9	44.7	53.2	56.9	45.1	52.5	56.4	45.8	51.3
	-2	58.0	46.1	54.2	50.0		50.0	54.2	45.9	52.1	59.1	46.2	54.7	59.0	46.2	54.4
	-1	61.3	47.3	60.5	50.0		50.0	55.4	46.2	54.6	62.5	47.3	61.6	62.6	47.5	62.0
	0	68.7	49.0	68.7	50.0		50.0	63.5	45.0	63.5	70.3	49.1	70.3	68.1	49.5	68.1
IIIB	-99	49.9	51.1	40.9	50.0		50.0	50.5	48.3	44.0	49.5	51.8	39.1	49.0	53.2	39.4
	-10	50.3	47.6	49.4	50.0		50.0	51.1	44.6	50.2	49.9	48.0	48.9	49.3	51.1	47.5
	-4	51.4	48.6	50.8	50.0		50.0	52.0	47.2	51.9	51.8	49.1	51.2	49.7	48.9	48.4
	-2	55.4	49.0	51.5	50.0		50.0	52.4	48.2	52.6	55.6	49.3	50.9	58.6	49.0	52.0
	-1	58.3	48.8	58.5	50.0		50.0	52.0	48.0	54.2	58.7	49.0	58.9	63.5	48.7	61.7
	0	64.8	49.7	64.8	50.0		50.0	41.9	51.8	41.9	66.4	49.4	66.4	74.8	49.0	74.8
IV	-99	51.1	45.6	43.8	50.0		50.0	52.3	43.2	49.3	50.4	45.6	38.8	48.5	55.7	40.9
	-10	60.2	42.7	59.6	50.0		50.0	55.3	46.2	54.3	65.1	40.6	63.8	69.1	47.8	69.4
	-4	54.4	40.0	53.2	50.0		50.0	52.9	40.3	51.0	61.6	38.5	60.9	27.1	51.4	24.5
	-2	58.6	49.4	91.3	48.3	51.4	91.3	72.0	47.6	0.0	32.4	50.4	0.0	0.0	0.0	0.0
	-1	55.0	50.0	57.5	48.3	51.4	48.3	64.9	48.7	64.9	32.4	50.4	0.0	0.0	0.0	0.0
	0	32.4	50.4	32.4	32.4	50.4	32.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HSDG	-99	49.3	60.5	37.5	50.0		50.0	49.8	54.3	41.1	49.1	61.2	35.8	48.8	62.8	36.5
	-10	50.2	54.0	43.4	50.0		50.0	50.7	48.8	47.0	50.2	54.3	42.3	49.8	56.7	40.1
	-4	55.9	44.6	53.2	50.0		50.0	54.3	44.6	53.5	57.1	44.5	53.6	56.3	44.6	52.7
	-2	58.2	46.4	53.8	50.0		50.0	54.9	45.6	51.9	59.5	46.4	54.6	58.8	46.7	53.7
	-1	62.1	47.0	61.2	50.0		50.0	57.1	45.4	56.2	63.3	47.1	62.0	63.5	47.3	62.7
	0	72.6	48.6	72.6	50.0		50.0	65.1	45.0	65.1	75.0	48.7	75.0	72.0	49.3	72.0
Senior	-99	49.3	55.4	29.2	50.0		50.0	50.2	47.8	32.9	49.3	55.2	29.5	48.8	56.6	28.3
	-10	50.2	50.6	44.3	50.0		50.0	50.4	45.0	48.8	50.2	50.0	44.1	50.0	52.4	42.2
	-4	54.6	47.5	49.2	50.0		50.0	51.7	47.4	50.6	54.9	47.3	49.5	55.7	47.8	48.5
	-2	59.7	45.4	56.8	50.0		50.0	52.1	47.3	51.9	60.8	45.5	57.6	61.4	45.0	57.0
	-1	62.4	47.7	62.2	50.0		50.0	51.9	48.6	52.1	63.8	47.7	63.6	63.7	47.5	63.1
	0	64.7	49.5	64.7	50.0		50.0	51.1	48.6	51.1	64.7	49.5	64.7	66.5	49.5	66.5
Non-Grad	-99	49.4	54.8	39.1	50.0		50.0	49.7	53.0	45.4	49.3	55.4	37.5	49.1	54.9	35.5
	-10	49.7	53.5	46.4	50.0		50.0	49.8	51.7	46.2	49.5	53.9	46.4	49.7	53.7	45.5
	-4	53.2	47.8	51.3	50.0		50.0	52.6	46.8	52.4	54.0	47.9	51.8	53.6	47.9	49.6
	-2	52.7	48.2	50.5	50.0		50.0	52.9	48.1	52.8	52.5	48.4	49.7	53.8	47.9	50.9
	-1	54.5	48.5	54.4	50.0		50.0	51.4	48.4	51.6	55.0	48.3	54.8	56.2	48.7	56.0
	0	65.4	49.5	65.4	29.2	58.3	29.2	73.2	48.7	73.2	63.1	49.6	63.1	0.0	0.0	0.0

Appendix F

AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments with Relevant Bounds

Table F1. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=1.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	ActREQ	109.3	108.7	104.7	109.3	114.3
	SimREQ	109.3	108.5	105.0	109.4	114.0
	SimEER	109.3	108.5	105.1	109.2	114.1
	MeanUre	107.3	106.0	102.1	107.7	112.8
	MeanRe	108.3	108.3	104.2	108.1	112.9
	MaxRe	113.1	108.3	106.1	114.8	120.0
	MaxUre	115.2	114.0	110.2	115.6	120.4
Male	ActREQ	110.3	109.9	106.4	109.9	114.7
	SimREQ	110.5	110.1	106.8	110.1	114.6
	SimEER	110.4	110.1	106.9	109.9	114.6
	MeanUre	108.9	108.0	104.6	108.6	113.6
	MeanRe	109.7	109.8	106.2	109.1	113.8
	MaxRe	114.4	109.8	107.7	115.6	120.7
	MaxUre	116.4	115.6	112.3	116.2	121.0
Female	ActREQ	104.1	102.7	98.8	106.3	111.4
	SimREQ	103.9	101.9	99.2	106.1	109.9
	SimEER	104.0	101.9	99.4	105.9	110.5
	MeanUre	100.3	97.7	94.6	103.3	107.3
	MeanRe	102.2	102.1	98.1	103.6	107.4
	MaxRe	107.4	102.1	101.4	111.2	115.7
	MaxUre	109.8	107.6	104.2	112.7	116.8
I-IIIA	ActREQ	113.6	114.2	112.6	112.6	115.2
	SimREQ	113.5	114.2	112.7	112.5	114.9
	SimEER	113.4	114.1	112.8	112.3	115.0
	MeanUre	112.1	112.5	111.0	111.2	113.8
	MeanRe	112.6	114.1	112.2	111.4	113.9
	MaxRe	117.7	114.1	113.5	118.1	121.0
	MaxUre	119.9	120.1	119.1	119.0	121.4
IIIB	ActREQ	98.5	97.1	96.2	100.4	103.7
	SimREQ	98.7	96.8	96.4	100.6	104.1
	SimEER	98.7	96.8	96.5	100.5	104.0
	MeanUre	95.4	93.0	92.6	98.0	101.7
	MeanRe	97.6	96.7	95.7	98.9	101.9
	MaxRe	101.7	96.7	98.5	105.4	108.9
	MaxUre	103.6	101.9	101.1	105.9	109.3
IV	ActREQ	94.7	94.1	92.8	98.3	100.5
	SimREQ	95.2	93.9	93.9	98.3	100.1
	SimEER	95.4	93.9	93.9	98.6	102.0
	MeanUre	90.7	89.3	89.1	94.4	95.7
	MeanRe	93.9	93.8	92.8	96.1	97.5
	MaxRe	97.2	93.8	95.2	103.0	104.9
	MaxUre	99.1	98.3	97.1	103.2	105.3

Table F1. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=1.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
HSDG	ActREQ	108.7	107.2	102.0	109.2	115.0
	SimREQ	109.0	107.0	102.4	109.5	114.9
	SimEER	108.9	107.0	102.5	109.3	114.9
	MeanUre	106.7	104.3	99.1	107.6	113.6
	MeanRe	107.8	106.9	101.6	108.1	113.7
	MaxRe	112.8	106.9	104.1	114.8	120.6
	MaxUre	114.6	112.5	107.3	115.4	121.0
Senior	ActREQ	107.9	105.8	104.6	107.4	111.3
	SimREQ	107.3	105.8	104.3	106.8	110.5
	SimEER	107.3	105.8	104.4	106.4	110.7
	MeanUre	105.5	101.9	101.5	105.4	109.7
	MeanRe	106.6	104.9	103.6	106.0	110.1
	MaxRe	111.8	104.9	105.0	112.8	117.6
	MaxUre	113.9	110.3	109.8	113.8	117.9
Non-Grad	ActREQ	111.5	111.5	109.5	111.0	115.8
	SimREQ	111.5	111.5	110.0	110.9	115.3
	SimEER	111.5	111.5	109.9	110.9	115.7
	MeanUre	110.0	109.8	107.9	109.7	114.3
	MeanRe	110.8	111.4	109.3	109.9	114.5
	MaxRe	114.6	111.4	110.6	116.3	121.6
	MaxUre	117.7	117.4	115.8	117.3	122.0

Table F2. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=2.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	ActREQ	107.1	106.6	102.8	106.6	112.6
	SimREQ	107.1	106.4	102.5	106.8	112.6
	SimEER	107.1	106.4	102.5	106.9	112.6
	MeanUre	105.8	104.7	101.0	105.7	111.7
	MeanRe	106.5	106.5	102.4	105.9	111.8
	MaxRe	109.7	106.5	103.7	110.6	116.5
	MaxUre	111.2	110.2	106.5	111.2	116.7
Male	ActREQ	108.4	108.7	104.7	107.2	113.1
	SimREQ	108.4	108.7	104.7	107.3	113.1
	SimEER	108.4	108.7	104.7	107.4	113.1
	MeanUre	107.6	107.5	103.7	106.7	112.5
	MeanRe	108.1	108.6	104.7	106.9	112.5
	MaxRe	111.1	108.6	105.5	111.2	117.1
	MaxUre	112.5	112.6	108.7	111.6	117.2
Female	ActREQ	101.4	99.3	96.7	104.0	109.0
	SimREQ	101.3	98.4	96.1	104.7	109.0
	SimEER	101.2	98.4	96.0	104.6	108.9
	MeanUre	98.8	95.2	93.5	102.0	106.8
	MeanRe	100.1	99.4	95.8	102.0	106.6
	MaxRe	104.3	99.4	98.3	108.4	112.8
	MaxUre	105.7	102.3	100.3	109.3	113.4
I-IIIA	ActREQ	112.4	113.6	111.7	111.1	113.9
	SimREQ	112.6	113.8	111.8	111.3	113.9
	SimEER	112.6	113.8	111.8	111.4	113.8
	MeanUre	111.4	112.3	110.6	110.1	113.0
	MeanRe	111.8	113.5	111.4	110.2	113.0
	MaxRe	115.2	113.5	112.2	115.1	117.8
	MaxUre	116.7	117.5	116.0	115.7	118.0
IIIB	ActREQ	95.6	94.9	93.4	97.2	100.4
	SimREQ	95.5	94.2	93.2	97.4	100.3
	SimEER	95.5	94.2	93.2	97.4	100.3
	MeanUre	93.7	91.9	91.2	96.0	99.1
	MeanRe	95.1	94.9	93.1	96.5	99.2
	MaxRe	97.9	94.9	95.0	100.7	104.2
	MaxUre	99.2	98.1	96.9	101.0	104.3
IV	ActREQ	91.3	90.5	90.5	93.5	94.4
	SimREQ	91.4	90.2	90.4	94.5	96.8
	SimEER	91.5	90.2	90.4	95.0	95.9
	MeanUre	88.9	87.9	87.9	92.1	93.0
	MeanRe	90.9	90.6	90.1	93.1	93.8
	MaxRe	92.9	90.6	91.6	97.7	99.1
	MaxUre	94.6	93.6	93.5	98.0	99.5

Table F2. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=2.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
HSDG	ActREQ	106.6	105.3	100.6	106.5	113.2
	SimREQ	106.7	105.3	100.4	106.9	113.1
	SimEER	106.7	105.3	100.4	106.9	113.1
	MeanUre	105.4	103.2	98.6	105.7	112.4
	MeanRe	106.1	105.4	100.2	106.0	112.4
	MaxRe	109.5	105.4	101.8	110.7	117.1
	MaxUre	110.7	108.9	104.3	111.1	117.2
Senior	ActREQ	106.0	102.1	102.5	106.0	110.1
	SimREQ	105.7	101.6	101.9	105.5	110.4
	SimEER	105.7	101.6	101.9	105.7	110.2
	MeanUre	104.4	99.2	100.2	104.5	109.3
	MeanRe	105.0	101.7	101.6	104.7	109.4
	MaxRe	108.4	101.7	102.9	109.3	114.2
	MaxUre	109.9	105.0	105.9	110.0	114.4
Non-Grad	ActREQ	109.1	109.7	107.2	107.8	113.8
	SimREQ	109.1	109.5	107.2	108.0	113.6
	SimEER	109.1	109.5	107.2	108.1	113.6
	MeanUre	108.1	108.4	106.2	107.0	112.8
	MeanRe	108.7	109.5	107.2	107.2	112.9
	MaxRe	111.2	109.5	107.8	111.8	117.8
	MaxUre	113.3	113.7	111.3	112.4	118.0

Table F3. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=3.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	ActREQ	105.8	104.9	100.7	106.9	112.1
	SimREQ	105.8	104.8	100.5	107.0	112.1
	SimEER	105.8	104.8	100.5	107.1	112.0
	MeanUre	104.9	103.8	99.3	106.3	111.3
	MeanRe	105.3	104.9	100.3	106.3	111.2
	MaxRe	107.9	104.9	101.7	110.0	115.0
	MaxUre	109.0	108.1	103.6	110.3	115.2
Male	ActREQ	107.2	106.3	102.3	107.7	112.8
	SimREQ	107.3	106.4	102.3	107.9	112.8
	SimEER	107.3	106.4	102.3	107.9	112.7
	MeanUre	106.6	105.8	101.6	107.3	112.3
	MeanRe	106.9	106.5	102.2	107.4	112.3
	MaxRe	109.4	106.5	103.4	110.8	115.8
	MaxUre	110.4	109.7	105.3	111.1	115.9
Female	ActREQ	100.4	99.1	96.1	102.8	108.1
	SimREQ	99.9	98.3	95.3	102.7	107.7
	SimEER	99.9	98.3	95.2	102.9	107.4
	MeanUre	98.2	96.5	93.5	101.3	105.8
	MeanRe	99.0	99.1	95.3	101.0	105.4
	MaxRe	102.4	99.1	97.5	106.1	111.0
	MaxUre	103.8	102.1	99.2	106.8	111.4
I-IIIA	ActREQ	112.1	113.3	111.6	111.1	113.2
	SimREQ	112.1	113.2	111.9	111.2	113.2
	SimEER	112.1	113.2	111.8	111.2	113.1
	MeanUre	111.2	112.2	110.6	110.4	112.4
	MeanRe	111.4	113.1	111.1	110.4	112.4
	MaxRe	114.2	113.1	112.4	114.1	116.2
	MaxUre	115.2	116.3	114.8	114.4	116.3
IIIB	ActREQ	94.5	92.7	92.8	96.9	99.2
	SimREQ	94.3	92.4	92.4	96.9	99.0
	SimEER	94.3	92.4	92.4	96.9	98.9
	MeanUre	93.1	91.3	91.2	95.9	97.9
	MeanRe	94.0	92.8	92.5	96.1	98.0
	MaxRe	96.3	92.8	94.3	99.7	102.0
	MaxUre	97.5	95.9	95.7	100.0	102.1
IV	ActREQ	89.3	88.6	88.9	91.1	91.4
	SimREQ	89.1	88.2	88.4	91.6	93.5
	SimEER	89.1	88.2	88.5	91.5	94.5
	MeanUre	88.0	87.3	87.3	90.3	92.1
	MeanRe	89.1	88.7	88.6	91.0	92.2
	MaxRe	90.5	88.7	89.8	94.1	95.9
	MaxUre	92.0	91.6	91.3	94.4	96.0

Table F3. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=3.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
HSDG	ActREQ	105.6	103.7	99.4	107.3	113.3
	SimREQ	105.6	103.9	99.2	107.4	113.1
	SimEER	105.6	103.9	99.1	107.4	113.1
	MeanUre	104.7	102.7	98.0	106.7	112.5
	MeanRe	105.1	103.9	99.0	106.7	112.4
	MaxRe	107.8	103.9	100.7	110.5	116.1
	MaxUre	108.7	107.0	102.3	110.7	116.2
Senior	ActREQ	104.8	104.3	100.1	104.7	109.5
	SimREQ	104.7	104.2	99.9	104.5	109.5
	SimEER	104.7	104.2	100.0	104.7	109.4
	MeanUre	103.5	102.4	98.2	103.6	108.8
	MeanRe	104.0	104.2	99.5	103.7	108.7
	MaxRe	106.8	104.2	100.7	107.4	112.8
	MaxUre	107.9	107.3	102.9	108.0	113.0
Non-Grad	ActREQ	107.1	106.7	103.6	107.7	112.7
	SimREQ	107.2	106.5	103.6	107.9	112.9
	SimEER	107.2	106.5	103.6	108.0	112.8
	MeanUre	106.3	105.8	102.5	107.2	111.9
	MeanRe	106.6	106.6	103.2	107.3	111.9
	MaxRe	109.0	106.6	104.5	110.8	115.6
	MaxUre	110.2	109.8	106.6	111.1	115.7

Table F4. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=4.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
Overall	ActREQ	106.1	105.6	102.0	106.7	110.6
	SimREQ	106.1	105.6	102.0	107.0	110.6
	SimEER	106.1	105.6	102.0	107.0	110.6
	MeanUre	105.0	104.1	100.7	106.1	109.8
	MeanRe	105.4	105.5	101.5	106.1	109.8
	MaxRe	108.1	105.5	103.1	109.8	113.6
	MaxUre	109.2	108.6	105.2	110.1	113.7
Male	ActREQ	107.6	107.6	103.5	107.9	111.6
	SimREQ	107.7	107.6	103.5	108.2	111.6
	SimEER	107.7	107.6	103.5	108.2	111.6
	MeanUre	107.0	106.8	102.7	107.6	111.0
	MeanRe	107.3	107.6	103.3	107.6	111.0
	MaxRe	109.7	107.6	104.5	111.0	114.5
	MaxUre	110.7	110.7	106.6	111.3	114.5
Female	ActREQ	100.7	100.0	98.8	101.1	105.7
	SimREQ	100.5	99.9	98.7	101.2	105.0
	SimEER	100.5	99.9	98.7	101.1	105.1
	MeanUre	98.3	97.0	96.3	99.1	103.6
	MeanRe	99.2	100.0	97.6	99.1	103.4
	MaxRe	102.6	100.0	100.2	104.1	108.9
	MaxUre	104.0	103.1	102.1	104.7	109.1
I-IIIA	ActREQ	111.7	112.8	110.9	111.1	112.7
	SimREQ	111.6	112.9	110.8	111.2	112.6
	SimEER	111.6	112.9	110.8	111.2	112.6
	MeanUre	110.8	111.5	109.7	110.5	112.0
	MeanRe	111.0	112.7	110.2	110.5	111.9
	MaxRe	113.9	112.7	111.7	114.2	115.7
	MaxUre	114.9	115.8	114.1	114.6	115.8
IIIB	ActREQ	94.6	93.3	93.4	95.7	98.0
	SimREQ	94.5	93.0	93.3	95.7	97.8
	SimEER	94.5	93.0	93.3	95.7	97.8
	MeanUre	93.0	91.3	91.5	94.3	96.8
	MeanRe	93.8	93.1	92.8	94.5	96.9
	MaxRe	96.2	93.1	94.6	98.2	100.6
	MaxUre	97.4	96.2	96.2	98.4	100.7
IV	ActREQ	89.1	88.5	88.5	90.4	91.9
	SimREQ	89.1	88.5	88.5	90.3	93.0
	SimEER	89.1	88.5	88.5	90.3	92.3
	MeanUre	87.7	87.2	87.0	89.0	90.7
	MeanRe	88.8	88.7	88.3	89.7	91.0
	MaxRe	90.3	88.7	89.7	92.3	94.1
	MaxUre	91.6	91.3	91.2	92.4	94.2

Table F4. AA Means for Actual, Simulated, and EPAS-Enhanced REQUEST Assignments and relevant bounds based on Unconstrained and Constrained Means and Maximums of Applicant AA Score-Vector by Number of Opportunities, Subgroup, and Limit Value for IRB=4.

		Number of Opportunities				
Subgroup	**Type**	**All**	**1**	**2-10**	**11-30**	**>=31**
HSDG	ActREQ	105.7	104.3	101.1	106.9	111.2
	SimREQ	105.6	104.1	100.9	107.1	111.0
	SimEER	105.6	104.1	100.9	107.1	111.1
	MeanUre	104.5	102.5	99.6	106.2	110.3
	MeanRe	104.9	104.0	100.4	106.2	110.3
	MaxRe	107.6	104.0	102.1	109.8	114.0
	MaxUre	108.6	106.9	104.1	110.1	114.0
Senior	ActREQ	105.1	104.2	101.5	105.1	108.9
	SimREQ	105.3	104.2	102.0	105.5	108.9
	SimEER	105.3	104.2	102.0	105.5	108.9
	MeanUre	104.1	102.7	100.2	104.3	108.0
	MeanRe	104.5	104.3	101.3	104.3	108.0
	MaxRe	107.5	104.3	102.8	108.4	111.9
	MaxUre	108.5	107.6	104.9	108.7	112.0
Non-Grad	ActREQ	109.4	110.1	107.1	109.1	113.2
	SimREQ	109.7	110.8	107.2	109.5	113.2
	SimEER	109.7	110.8	107.2	109.5	113.2
	MeanUre	108.7	109.1	106.0	108.7	112.5
	MeanRe	109.0	110.0	106.6	108.8	112.4
	MaxRe	111.3	110.0	107.9	112.3	116.3
	MaxUre	112.8	113.3	110.3	112.6	116.4

Appendix G

Analytically Simulated AA by AA Status and Counselor Performance

Table G1. Analytically Simulated Mean AA for REQUEST, EPAS-Enhanced REQUEST, and AA-Based Rank Conditions by Number of Opportunities, Subgroup, AA Status (AA), and Counselor Performance (CP) for IRB=1.

			Number of Opportunities														
			All			**1**			**2-10**			**11-30**			**>=31**		
Subgroup	**AA**	**CP**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**
Overall	Y	60	109.4	109.4	109.4	108.6	108.5	108.6	104.9	104.9	104.9	109.5	109.5	109.5	114.3	114.3	114.3
		50	109.4	109.4	109.6	108.6	108.5	108.6	104.9	104.9	105.0	109.5	109.6	109.9	114.3	114.4	114.7
		40	109.4	109.4	109.8	108.6	108.5	108.6	104.9	104.9	105.1	109.5	109.6	110.1	114.2	114.4	115.0
	N	60	109.0	109.0	109.0	108.6	108.5	108.6	104.7	104.7	104.7	109.0	109.0	108.9	113.7	113.8	113.7
		50	109.0	109.0	109.3	108.6	108.5	108.6	104.7	104.7	104.8	109.0	109.0	109.3	113.7	113.8	114.1
		40	109.0	109.1	109.5	108.6	108.5	108.6	104.7	104.8	104.9	109.0	109.1	109.6	113.7	113.8	114.4
Male	Y	60	110.5	110.5	110.5	109.9	109.9	109.9	106.6	106.6	106.6	110.1	110.1	110.1	114.8	114.8	114.8
		50	110.5	110.5	110.7	109.9	109.9	109.9	106.6	106.6	106.7	110.1	110.2	110.5	114.8	114.9	115.2
		40	110.4	110.5	110.9	109.9	109.9	109.9	106.6	106.6	106.7	110.0	110.2	110.7	114.8	114.9	115.5
	N	60	110.1	110.1	110.1	109.9	109.9	109.9	106.5	106.5	106.5	109.6	109.6	109.6	114.3	114.3	114.2
		50	110.1	110.1	110.4	109.9	109.9	109.9	106.5	106.5	106.6	109.6	109.7	110.0	114.3	114.3	114.7
		40	110.1	110.2	110.6	109.9	109.9	109.9	106.5	106.5	106.6	109.6	109.7	110.2	114.2	114.4	115.0
Female	Y	60	104.3	104.3	104.3	102.3	102.6	102.3	99.4	99.4	99.4	106.5	106.5	106.4	110.7	110.7	110.6
		50	104.3	104.3	104.5	102.3	102.6	102.3	99.4	99.5	99.6	106.5	106.5	106.8	110.7	110.8	111.0
		40	104.3	104.4	104.7	102.3	102.6	102.3	99.4	99.5	99.8	106.5	106.6	107.0	110.7	110.8	111.2
	N	60	103.9	103.9	103.8	102.3	102.6	102.3	99.1	99.1	99.1	105.9	105.9	105.9	110.1	110.1	110.0
		50	103.9	103.9	104.1	102.3	102.6	102.3	99.1	99.2	99.3	105.9	106.0	106.3	110.1	110.2	110.4
		40	103.9	104.0	104.3	102.3	102.6	102.3	99.1	99.2	99.5	105.9	106.1	106.5	110.1	110.2	110.7
I-IIIA	Y	60	113.6	113.6	113.6	114.1	114.2	114.1	112.5	112.5	112.5	112.6	112.6	112.6	115.2	115.3	115.2
		50	113.6	113.6	113.9	114.1	114.2	114.1	112.5	112.5	112.6	112.6	112.7	113.0	115.2	115.3	115.6
		40	113.5	113.6	114.1	114.1	114.2	114.1	112.5	112.5	112.7	112.6	112.7	113.3	115.2	115.3	115.9
	N	60	113.2	113.2	113.2	114.1	114.2	114.1	112.4	112.4	112.4	112.1	112.1	112.1	114.7	114.7	114.6
		50	113.2	113.2	113.5	114.1	114.2	114.1	112.4	112.4	112.5	112.1	112.2	112.5	114.7	114.7	115.1
		40	113.2	113.3	113.7	114.1	114.2	114.1	112.4	112.4	112.6	112.1	112.2	112.8	114.6	114.8	115.4
IIIB	Y	60	98.6	98.6	98.6	96.9	96.9	96.9	96.5	96.5	96.5	100.4	100.4	100.4	103.8	103.8	103.8
		50	98.6	98.7	98.8	96.9	96.9	96.9	96.5	96.5	96.6	100.4	100.5	100.8	103.8	103.9	104.2
		40	98.6	98.7	99.0	96.9	96.9	96.9	96.5	96.5	96.7	100.4	100.5	101.0	103.8	104.0	104.5
	N	60	98.3	98.3	98.3	96.9	96.9	96.9	96.3	96.2	96.2	100.0	100.0	99.9	103.2	103.3	103.2
		50	98.3	98.3	98.5	96.9	96.9	96.9	96.2	96.3	96.4	100.0	100.0	100.3	103.3	103.4	103.6
		40	98.3	98.4	98.7	96.9	96.9	96.9	96.2	96.3	96.5	100.0	100.1	100.6	103.3	103.4	104.0
IV	Y	60	94.9	94.9	94.8	94.0	94.0	94.0	93.2	93.2	93.2	98.4	98.4	98.4	100.0	100.0	100.0
		50	94.8	94.9	95.0	94.0	94.0	94.0	93.2	93.2	93.3	98.4	98.5	98.8	100.0	100.1	100.4
		40	94.8	94.9	95.2	94.0	94.0	94.0	93.2	93.2	93.4	98.4	98.5	99.0	100.0	100.1	100.6
	N	60	94.6	94.6	94.6	94.0	94.0	94.0	93.0	93.0	93.0	97.8	97.7	97.7	99.5	99.5	99.5
		50	94.6	94.6	94.8	94.0	94.0	94.0	93.0	93.0	93.2	97.8	97.8	98.1	99.5	99.6	99.9
		40	94.6	94.6	94.9	94.0	94.0	94.0	93.0	93.0	93.3	97.7	97.9	98.4	99.5	99.6	100.2
HSDG	Y	60	109.0	109.0	108.9	107.2	107.2	107.2	102.4	102.4	102.4	109.5	109.5	109.4	115.1	115.1	115.0
		50	109.0	109.0	109.2	107.2	107.2	107.2	102.4	102.4	102.5	109.4	109.5	109.8	115.1	115.2	115.5
		40	108.9	109.0	109.4	107.2	107.2	107.2	102.4	102.4	102.6	109.4	109.6	110.1	115.0	115.2	115.7
	N	60	108.6	108.6	108.5	107.2	107.2	107.2	102.2	102.2	102.2	108.9	108.9	108.9	114.5	114.6	114.5
		50	108.6	108.6	108.9	107.2	107.2	107.2	102.2	102.2	102.3	108.9	109.0	109.3	114.5	114.6	114.9
		40	108.6	108.7	109.1	107.2	107.2	107.2	102.2	102.2	102.4	109.0	109.1	109.6	114.5	114.7	115.2
Senior	Y	60	107.7	107.7	107.6	105.4	105.4	105.4	104.3	104.3	104.3	107.2	107.2	107.1	111.3	111.3	111.2
		50	107.6	107.7	108.0	105.4	105.4	105.4	104.3	104.3	104.3	107.1	107.2	107.5	111.2	111.3	111.7
		40	107.6	107.7	108.2	105.4	105.4	105.4	104.3	104.3	104.4	107.0	107.2	107.8	111.1	111.3	112.0
	N	60	107.2	107.2	107.2	105.4	105.4	105.4	104.2	104.2	104.2	106.6	106.6	106.5	110.7	110.7	110.6
		50	107.2	107.3	107.5	105.4	105.4	105.4	104.2	104.2	104.2	106.5	106.6	107.0	110.6	110.7	111.1
		40	107.2	107.3	107.8	105.4	105.4	105.4	104.2	104.2	104.3	106.5	106.6	107.3	110.5	110.7	111.4
Non-Grad	Y	60	111.6	111.6	111.5	111.4	111.5	111.4	109.7	109.6	109.7	111.2	111.3	111.2	115.8	115.7	115.7
		50	111.6	111.6	111.8	111.4	111.5	111.4	109.7	109.6	109.7	111.2	111.3	111.6	115.7	115.8	116.1
		40	111.5	111.6	111.9	111.4	111.5	111.4	109.7	109.6	109.8	111.2	111.3	111.8	115.7	115.8	116.4
	N	60	111.3	111.3	111.3	111.4	111.5	111.4	109.6	109.5	109.6	110.7	110.8	110.7	115.2	115.2	115.2
		50	111.3	111.3	111.5	111.4	111.5	111.4	109.6	109.5	109.6	110.7	110.8	111.1	115.2	115.2	115.6
		40	111.3	111.3	111.6	111.4	111.5	111.4	109.6	109.6	109.7	110.7	110.9	111.4	115.1	115.3	115.9

Table G2. Analytically Simulated Mean AA for REQUEST, EPAS-Enhanced REQUEST, and AA-Based Rank Conditions by Number of Opportunities, Subgroup, AA Status (AA), and Counselor Performance (CP) for IRB=2.

			Number of Opportunities														
			All			1			2-10			11-30			>=31		
Subgroup	**AA**	**CP**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**	**Inc**	**Exc**	**Add**
Overall	Y	60	107.3	107.3	107.3	106.6	106.6	106.6	102.8	102.8	102.8	107.0	107.2	107.0	112.7	112.7	112.8
		50	107.3	107.3	107.4	106.6	106.6	106.6	102.8	102.8	102.9	107.0	107.2	107.2	112.7	112.8	112.9
		40	107.3	107.3	107.5	106.6	106.6	106.6	102.8	102.8	102.9	107.0	107.2	107.3	112.7	112.8	113.1
	N	60	107.1	107.1	107.1	106.6	106.6	106.6	102.8	102.8	102.8	106.8	107.0	106.8	112.5	112.5	112.6
		50	107.1	107.2	107.3	106.6	106.6	106.6	102.8	102.8	102.8	106.8	107.0	107.0	112.5	112.6	112.7
		40	107.1	107.2	107.4	106.6	106.6	106.6	102.8	102.8	102.9	106.8	107.0	107.1	112.5	112.6	112.9
Male	Y	60	108.5	108.5	108.5	108.6	108.6	108.6	104.7	104.7	104.7	107.5	107.6	107.5	113.2	113.2	113.2
		50	108.5	108.5	108.6	108.6	108.6	108.6	104.7	104.7	104.8	107.4	107.7	107.6	113.2	113.3	113.4
		40	108.5	108.5	108.7	108.6	108.6	108.6	104.7	104.7	104.8	107.4	107.7	107.8	113.2	113.3	113.5
	N	60	108.3	108.3	108.4	108.6	108.6	108.6	104.7	104.7	104.7	107.3	107.5	107.3	113.0	113.0	113.0
		50	108.3	108.4	108.5	108.6	108.6	108.6	104.7	104.7	104.7	107.3	107.5	107.5	113.0	113.1	113.2
		40	108.3	108.4	108.6	108.6	108.6	108.6	104.7	104.7	104.7	107.2	107.5	107.6	113.0	113.1	113.3
Female	Y	60	102.0	102.0	102.0	99.4	99.4	99.4	97.0	97.0	97.0	105.0	105.1	105.1	109.3	109.3	109.3
		50	102.0	102.0	102.1	99.4	99.4	99.4	97.0	97.0	97.1	105.1	105.2	105.2	109.3	109.3	109.5
		40	102.0	102.1	102.2	99.4	99.4	99.4	97.0	97.0	97.1	105.1	105.2	105.4	109.3	109.3	109.6
	N	60	101.9	101.8	101.9	99.4	99.4	99.4	96.9	96.9	96.9	104.8	104.8	104.8	109.0	109.0	109.1
		50	101.9	101.9	102.0	99.4	99.4	99.4	96.9	96.9	97.0	104.8	104.9	105.0	109.0	109.1	109.3
		40	101.9	101.9	102.1	99.4	99.4	99.4	96.9	96.9	97.0	104.8	104.9	105.1	109.0	109.1	109.4
I-IIIA	Y	60	112.7	112.7	112.7	113.7	113.7	113.7	111.9	111.9	111.9	111.5	111.6	111.5	114.0	114.0	114.0
		50	112.7	112.7	112.8	113.7	113.7	113.7	111.9	111.9	112.0	111.5	111.7	111.7	114.0	114.1	114.2
		40	112.7	112.7	112.9	113.7	113.7	113.7	111.9	111.9	112.0	111.5	111.7	111.8	114.0	114.1	114.3
	N	60	112.5	112.5	112.5	113.7	113.7	113.7	111.9	111.9	111.9	111.3	111.4	111.3	113.8	113.8	113.8
		50	112.5	112.6	112.7	113.7	113.7	113.7	111.9	111.9	111.9	111.3	111.5	111.5	113.8	113.8	114.0
		40	112.5	112.6	112.8	113.7	113.7	113.7	111.9	111.9	111.9	111.3	111.5	111.6	113.8	113.9	114.2
IIIB	Y	60	95.8	95.8	95.8	94.9	94.9	94.9	93.6	93.6	93.6	97.4	97.4	97.4	100.4	100.3	100.4
		50	95.7	95.8	95.9	94.9	94.9	94.9	93.6	93.6	93.7	97.3	97.5	97.6	100.3	100.3	100.6
		40	95.7	95.8	95.9	94.9	94.9	94.9	93.6	93.6	93.7	97.3	97.5	97.7	100.3	100.3	100.7
	N	60	95.6	95.7	95.7	94.9	94.9	94.9	93.5	93.5	93.5	97.2	97.3	97.2	100.1	100.1	100.2
		50	95.6	95.7	95.8	94.9	94.9	94.9	93.5	93.5	93.6	97.2	97.3	97.4	100.1	100.1	100.4
		40	95.6	95.7	95.8	94.9	94.9	94.9	93.5	93.5	93.6	97.2	97.3	97.5	100.1	100.1	100.5
IV	Y	60	91.4	91.4	91.4	90.6	90.6	90.6	90.4	90.4	90.4	94.3	94.3	94.3	95.1	95.1	95.1
		50	91.4	91.4	91.5	90.6	90.6	90.6	90.4	90.4	90.5	94.3	94.4	94.5	95.0	95.1	95.3
		40	91.4	91.5	91.6	90.6	90.6	90.6	90.4	90.4	90.5	94.3	94.4	94.6	95.0	95.1	95.4
	N	60	91.4	91.4	91.4	90.6	90.6	90.6	90.4	90.4	90.4	94.1	94.1	94.1	94.9	94.9	94.9
		50	91.3	91.4	91.4	90.6	90.6	90.6	90.4	90.4	90.5	94.1	94.2	94.3	94.8	94.9	95.0
		40	91.3	91.4	91.5	90.6	90.6	90.6	90.4	90.4	90.5	94.1	94.2	94.4	94.8	94.9	95.2
HSDG	Y	60	106.9	106.9	106.9	105.5	105.5	105.5	100.7	100.7	100.7	107.0	107.2	107.0	113.3	113.3	113.3
		50	106.9	106.9	107.0	105.5	105.5	105.5	100.7	100.7	100.7	107.0	107.2	107.2	113.3	113.4	113.5
		40	106.9	106.9	107.1	105.5	105.5	105.5	100.7	100.7	100.8	107.0	107.3	107.3	113.3	113.4	113.6
	N	60	106.7	106.7	106.7	105.5	105.5	105.5	100.6	100.6	100.6	106.8	107.0	106.8	113.1	113.1	113.1
		50	106.7	106.8	106.9	105.5	105.5	105.5	100.6	100.6	100.7	106.8	107.0	107.0	113.1	113.2	113.3
		40	106.7	106.8	107.0	105.5	105.5	105.5	100.6	100.7	100.7	106.8	107.1	107.1	113.1	113.2	113.4
Senior	Y	60	105.9	105.9	105.9	101.8	101.8	101.8	102.2	102.2	102.2	105.8	105.8	105.8	110.4	110.4	110.4
		50	105.9	105.9	106.1	101.8	101.8	101.8	102.2	102.2	102.3	105.8	105.8	106.0	110.3	110.4	110.6
		40	105.9	106.0	106.2	101.8	101.8	101.8	102.2	102.2	102.3	105.8	105.8	106.1	110.3	110.4	110.7
	N	60	105.8	105.8	105.8	101.8	101.8	101.8	102.2	102.2	102.2	105.6	105.6	105.6	110.1	110.1	110.1
		50	105.8	105.8	105.9	101.8	101.8	101.8	102.2	102.2	102.2	105.6	105.6	105.8	110.1	110.2	110.3
		40	105.8	105.8	106.0	101.8	101.8	101.8	102.2	102.2	102.3	105.6	105.6	105.9	110.1	110.2	110.5
Non-Grad	Y	60	109.3	109.3	109.3	109.5	109.5	109.5	107.4	107.4	107.4	108.2	108.4	108.2	113.9	113.9	113.9
		50	109.3	109.3	109.4	109.5	109.5	109.5	107.4	107.4	107.4	108.2	108.4	108.4	113.9	113.9	114.1
		40	109.3	109.3	109.4	109.5	109.5	109.5	107.4	107.4	107.4	108.2	108.4	108.5	113.9	113.9	114.2
	N	60	109.2	109.2	109.2	109.5	109.5	109.5	107.4	107.4	107.4	108.0	108.2	108.0	113.7	113.7	113.7
		50	109.2	109.2	109.3	109.5	109.5	109.5	107.4	107.4	107.4	108.0	108.2	108.2	113.7	113.7	113.9
		40	109.2	109.2	109.3	109.5	109.5	109.5	107.4	107.4	107.4	108.0	108.2	108.3	113.7	113.7	114.0

Table G3. Analytically Simulated Mean AA for REQUEST, EPAS-Enhanced REQUEST, and AA-Based Rank Conditions by Number of Opportunities, Subgroup, AA Status (AA), and Counselor Performance (CP) for IRB=3.

			Number of Opportunities														
			All			1			2-10			11-30			>=31		
Subgroup	AA	CP	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add
Overall	Y	60	106.0	106.0	106.0	105.1	105.0	105.1	100.8	100.8	100.8	107.2	107.2	107.2	112.1	112.1	112.1
		50	106.0	106.0	106.1	105.1	105.0	105.1	100.8	100.8	100.9	107.1	107.3	107.4	112.1	112.1	112.3
		40	106.0	106.0	106.2	105.1	105.0	105.1	100.8	100.8	100.9	107.1	107.3	107.5	112.1	112.1	112.4
	N	60	105.8	105.8	105.8	105.1	105.0	105.1	100.7	100.7	100.7	106.8	106.9	106.8	111.8	111.8	111.8
		50	105.8	105.8	105.9	105.1	105.0	105.1	100.7	100.7	100.8	106.8	106.9	107.0	111.8	111.8	112.0
		40	105.8	105.8	106.0	105.1	105.0	105.1	100.7	100.7	100.8	106.8	107.0	107.2	111.8	111.8	112.1
Male	Y	60	107.4	107.4	107.4	106.5	106.5	106.5	102.5	102.5	102.5	108.0	108.0	108.0	112.8	112.8	112.9
		50	107.4	107.4	107.5	106.5	106.5	106.5	102.5	102.5	102.5	108.0	108.1	108.2	112.8	112.8	113.0
		40	107.3	107.4	107.6	106.5	106.5	106.5	102.5	102.5	102.6	107.9	108.1	108.3	112.8	112.9	113.1
	N	60	107.2	107.2	107.2	106.5	106.5	106.5	102.4	102.4	102.4	107.7	107.7	107.7	112.6	112.5	112.6
		50	107.2	107.2	107.3	106.5	106.5	106.5	102.4	102.4	102.4	107.7	107.8	107.9	112.6	112.6	112.8
		40	107.2	107.2	107.4	106.5	106.5	106.5	102.4	102.4	102.5	107.7	107.8	108.0	112.6	112.6	112.9
Female	Y	60	100.4	100.4	100.4	99.2	99.1	99.2	96.2	96.2	96.2	103.0	103.2	103.0	107.6	107.6	107.6
		50	100.4	100.5	100.6	99.2	99.1	99.2	96.2	96.2	96.3	103.0	103.2	103.2	107.5	107.7	107.8
		40	100.4	100.5	100.7	99.2	99.1	99.2	96.2	96.2	96.4	103.0	103.3	103.4	107.5	107.7	107.9
	N	60	100.1	100.1	100.1	99.2	99.1	99.2	96.0	96.0	96.0	102.5	102.6	102.5	107.0	107.1	107.1
		50	100.1	100.1	100.3	99.2	99.1	99.2	96.0	96.0	96.1	102.5	102.7	102.8	107.0	107.2	107.3
		40	100.1	100.2	100.4	99.2	99.1	99.2	96.0	96.0	96.2	102.4	102.8	102.9	107.0	107.2	107.5
I-IIIA	Y	60	112.1	112.1	112.1	113.3	113.3	113.3	111.8	111.8	111.8	111.2	111.3	111.3	113.2	113.2	113.2
		50	112.1	112.2	112.3	113.3	113.3	113.3	111.8	111.8	111.8	111.2	111.3	111.4	113.2	113.3	113.4
		40	112.1	112.2	112.4	113.3	113.3	113.3	111.8	111.8	111.9	111.2	111.3	111.6	113.2	113.3	113.5
	N	60	111.9	111.9	111.9	113.3	113.3	113.3	111.7	111.6	111.7	110.9	110.9	110.9	112.9	112.9	112.9
		50	111.9	111.9	112.0	113.3	113.3	113.3	111.6	111.7	111.7	110.9	111.0	111.1	112.9	113.0	113.1
		40	111.9	112.0	112.1	113.3	113.3	113.3	111.6	111.7	111.8	110.9	111.0	111.3	112.9	113.0	113.3
IIIB	Y	60	94.6	94.6	94.6	92.8	92.8	92.8	92.9	92.9	92.9	97.0	97.1	97.1	99.1	99.1	99.1
		50	94.6	94.6	94.8	92.8	92.8	92.8	92.9	92.9	93.1	97.0	97.1	97.2	99.0	99.1	99.3
		40	94.6	94.7	94.8	92.8	92.8	92.8	92.9	92.9	93.1	97.0	97.1	97.4	99.0	99.1	99.4
	N	60	94.4	94.4	94.4	92.8	92.8	92.8	92.8	92.8	92.8	96.7	96.8	96.7	98.7	98.7	98.7
		50	94.4	94.4	94.6	92.8	92.8	92.8	92.8	92.8	92.9	96.7	96.8	96.9	98.6	98.7	98.9
		40	94.4	94.5	94.7	92.8	92.8	92.8	92.8	92.8	93.0	96.7	96.8	97.1	98.6	98.7	99.1
IV	Y	60	89.4	89.5	89.5	88.7	88.8	88.7	88.8	88.8	88.8	91.8	91.8	91.8	93.8	93.8	93.8
		50	89.4	89.5	89.5	88.7	88.8	88.7	88.8	88.8	88.9	91.8	91.8	92.0	93.7	93.8	94.0
		40	89.4	89.5	89.6	88.7	88.8	88.7	88.8	88.8	88.9	91.7	91.8	92.1	93.6	93.8	94.2
	N	60	89.3	89.3	89.3	88.7	88.8	88.7	88.7	88.7	88.7	91.5	91.6	91.6	93.3	93.3	93.3
		50	89.3	89.3	89.4	88.7	88.8	88.7	88.7	88.7	88.8	91.5	91.5	91.7	93.2	93.3	93.6
		40	89.3	89.3	89.5	88.7	88.8	88.7	88.7	88.7	88.8	91.4	91.5	91.9	93.1	93.3	93.7
HSDG	Y	60	105.8	105.8	105.8	104.0	104.0	104.0	99.6	99.6	99.6	107.6	107.6	107.6	113.2	113.2	113.2
		50	105.8	105.9	106.0	104.0	104.0	104.0	99.6	99.6	99.7	107.5	107.7	107.8	113.2	113.2	113.4
		40	105.8	105.9	106.1	104.0	104.0	104.0	99.6	99.6	99.8	107.5	107.7	107.9	113.2	113.2	113.5
	N	60	105.6	105.6	105.6	104.0	104.0	104.0	99.5	99.5	99.5	107.2	107.3	107.2	112.9	112.9	112.9
		50	105.6	105.6	105.7	104.0	104.0	104.0	99.5	99.5	99.6	107.2	107.3	107.4	112.9	112.9	113.1
		40	105.6	105.6	105.8	104.0	104.0	104.0	99.5	99.5	99.6	107.2	107.4	107.6	112.9	113.0	113.2
Senior	Y	60	104.8	104.8	104.8	104.5	104.5	104.5	100.1	100.1	100.1	104.7	104.7	104.7	109.6	109.6	109.6
		50	104.8	104.8	105.0	104.5	104.5	104.5	100.1	100.1	100.2	104.7	104.7	104.8	109.6	109.6	109.8
		40	104.8	104.9	105.1	104.5	104.5	104.5	100.1	100.1	100.2	104.7	104.7	105.0	109.6	109.6	109.9
	N	60	104.6	104.6	104.6	104.5	104.5	104.5	100.0	100.0	100.0	104.3	104.3	104.3	109.2	109.2	109.2
		50	104.6	104.6	104.7	104.5	104.5	104.5	100.0	100.0	100.1	104.3	104.4	104.5	109.2	109.3	109.5
		40	104.6	104.6	104.8	104.5	104.5	104.5	100.0	100.0	100.1	104.3	104.4	104.6	109.3	109.3	109.6
Non-Grad	Y	60	107.3	107.3	107.3	106.8	106.7	106.8	103.7	103.7	103.7	108.1	108.1	108.1	112.8	112.8	112.8
		50	107.3	107.3	107.4	106.8	106.7	106.8	103.7	103.7	103.8	108.0	108.2	108.3	112.8	112.8	113.0
		40	107.2	107.3	107.5	106.8	106.7	106.8	103.7	103.7	103.8	108.0	108.2	108.4	112.8	112.8	113.1
	N	60	107.1	107.1	107.1	106.8	106.7	106.8	103.6	103.6	103.6	107.8	107.9	107.8	112.5	112.5	112.5
		50	107.1	107.1	107.2	106.8	106.7	106.8	103.6	103.6	103.7	107.8	107.9	108.0	112.5	112.5	112.7
		40	107.1	107.1	107.3	106.8	106.7	106.8	103.6	103.6	103.7	107.7	107.9	108.1	112.5	112.5	112.8

Table G4. Analytically Simulated Mean AA for REQUEST, EPAS-Enhanced REQUEST, and AA-Based Rank Conditions by Number of Opportunities, Subgroup, AA Status (AA), and Counselor Performance (CP) for IRB=4.

			Number of Opportunities														
			All			1			2-10			11-30			>=31		
Subgroup	AA	CP	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add	Inc	Exc	Add
Overall	Y	60	106.3	106.3	106.3	105.7	105.7	105.7	102.3	102.3	102.2	107.0	107.1	107.0	110.7	110.7	110.6
		50	106.3	106.3	106.5	105.7	105.7	105.7	102.3	102.3	102.4	107.0	107.1	107.3	110.7	110.7	111.0
		40	106.3	106.3	106.6	105.7	105.7	105.7	102.3	102.3	102.5	107.0	107.1	107.5	110.6	110.7	111.2
	N	60	105.9	105.9	105.9	105.7	105.7	105.7	102.0	102.0	102.0	106.5	106.6	106.5	110.2	110.2	110.2
		50	105.9	105.9	106.2	105.7	105.7	105.7	102.0	102.1	102.2	106.5	106.6	106.8	110.2	110.2	110.5
		40	105.9	105.9	106.3	105.7	105.7	105.7	102.0	102.1	102.3	106.5	106.6	107.1	110.2	110.2	110.8
Male	Y	60	107.8	107.8	107.8	107.7	107.7	107.7	103.7	103.7	103.7	108.2	108.3	108.2	111.6	111.6	111.6
		50	107.8	107.8	108.0	107.7	107.7	107.7	103.7	103.7	103.8	108.2	108.3	108.5	111.6	111.6	111.9
		40	107.8	107.8	108.1	107.7	107.7	107.7	103.7	103.7	103.9	108.2	108.3	108.7	111.6	111.6	112.1
	N	60	107.5	107.5	107.5	107.7	107.7	107.7	103.5	103.5	103.5	107.8	107.9	107.8	111.2	111.2	111.1
		50	107.5	107.5	107.7	107.7	107.7	107.7	103.5	103.6	103.6	107.8	107.9	108.1	111.2	111.2	111.5
		40	107.5	107.5	107.9	107.7	107.7	107.7	103.5	103.6	103.7	107.8	107.9	108.3	111.2	111.2	111.7
Female	Y	60	100.8	100.8	100.8	100.3	100.3	100.3	99.0	99.0	99.0	101.2	101.4	101.2	105.5	105.4	105.5
		50	100.8	100.8	101.0	100.3	100.3	100.3	99.0	99.0	99.2	101.2	101.4	101.5	105.5	105.4	105.9
		40	100.8	100.8	101.2	100.3	100.3	100.3	99.0	99.0	99.3	101.2	101.4	101.8	105.5	105.4	106.1
	N	60	100.3	100.3	100.3	100.3	100.3	100.3	98.6	98.6	98.6	100.4	100.6	100.4	104.7	104.5	104.6
		50	100.3	100.3	100.6	100.3	100.3	100.3	98.6	98.6	98.8	100.4	100.6	100.8	104.6	104.5	105.1
		40	100.3	100.3	100.8	100.3	100.3	100.3	98.6	98.7	99.0	100.4	100.6	101.2	104.6	104.5	105.4
I-IIIA	Y	60	111.8	111.8	111.8	112.9	112.9	112.9	111.0	110.9	111.0	111.3	111.4	111.3	112.7	112.7	112.7
		50	111.8	111.8	112.0	112.9	112.9	112.9	111.0	110.9	111.1	111.3	111.4	111.6	112.7	112.7	113.0
		40	111.8	111.8	112.2	112.9	112.9	112.9	110.9	110.9	111.2	111.3	111.4	111.8	112.7	112.7	113.2
	N	60	111.4	111.4	111.4	112.9	112.9	112.9	110.8	110.7	110.7	110.8	110.9	110.8	112.2	112.3	112.2
		50	111.4	111.4	111.7	112.9	112.9	112.9	110.7	110.7	110.9	110.8	110.9	111.1	112.3	112.3	112.6
		40	111.4	111.4	111.8	112.9	112.9	112.9	110.7	110.7	111.0	110.8	110.9	111.4	112.3	112.3	112.8
IIIB	Y	60	94.7	94.7	94.7	93.3	93.3	93.3	93.5	93.5	93.5	95.7	95.8	95.7	97.9	97.9	97.9
		50	94.7	94.7	94.9	93.3	93.3	93.3	93.5	93.5	93.6	95.7	95.7	96.0	97.9	97.8	98.2
		40	94.6	94.7	95.0	93.3	93.3	93.3	93.5	93.5	93.7	95.6	95.7	96.2	97.8	97.8	98.5
	N	60	94.4	94.4	94.3	93.3	93.3	93.3	93.3	93.2	93.2	95.3	95.3	95.2	97.4	97.4	97.4
		50	94.3	94.4	94.6	93.3	93.3	93.3	93.3	93.3	93.4	95.2	95.3	95.5	97.4	97.4	97.8
		40	94.3	94.4	94.7	93.3	93.3	93.3	93.3	93.3	93.5	95.2	95.2	95.8	97.3	97.3	98.0
IV	Y	60	89.3	89.3	89.3	88.7	88.7	88.7	88.7	88.7	88.7	90.5	90.5	90.4	91.8	91.8	91.8
		50	89.3	89.3	89.4	88.7	88.7	88.7	88.7	88.7	88.8	90.4	90.5	90.7	91.7	91.7	92.1
		40	89.3	89.3	89.5	88.7	88.7	88.7	88.7	88.8	88.9	90.4	90.4	90.8	91.6	91.6	92.3
	N	60	89.1	89.1	89.1	88.7	88.7	88.7	88.5	88.5	88.5	90.2	90.3	90.2	91.4	91.5	91.4
		50	89.1	89.1	89.2	88.7	88.7	88.7	88.6	88.5	88.7	90.2	90.2	90.4	91.3	91.3	91.7
		40	89.1	89.1	89.3	88.7	88.7	88.7	88.6	88.6	88.8	90.1	90.2	90.6	91.2	91.2	91.9
HSDG	Y	60	105.8	105.8	105.8	104.2	104.2	104.2	101.3	101.3	101.2	107.1	107.2	107.1	111.1	111.1	111.1
		50	105.8	105.8	106.0	104.2	104.2	104.2	101.3	101.3	101.4	107.1	107.2	107.4	111.1	111.1	111.4
		40	105.8	105.8	106.2	104.2	104.2	104.2	101.2	101.3	101.5	107.1	107.2	107.6	111.1	111.1	111.6
	N	60	105.5	105.5	105.4	104.2	104.2	104.2	101.0	101.1	101.0	106.7	106.7	106.6	110.7	110.7	110.6
		50	105.5	105.5	105.7	104.2	104.2	104.2	101.0	101.1	101.2	106.7	106.7	107.0	110.7	110.7	111.0
		40	105.5	105.5	105.9	104.2	104.2	104.2	101.0	101.1	101.3	106.7	106.8	107.2	110.7	110.7	111.2
Senior	Y	60	105.4	105.4	105.4	104.5	104.5	104.5	102.0	101.9	102.0	105.5	105.7	105.5	108.8	108.8	108.8
		50	105.4	105.4	105.6	104.5	104.5	104.5	102.0	101.9	102.1	105.5	105.6	105.8	108.8	108.8	109.1
		40	105.4	105.4	105.8	104.5	104.5	104.5	102.0	101.9	102.2	105.4	105.6	106.0	108.8	108.8	109.4
	N	60	104.9	104.9	104.9	104.5	104.5	104.5	101.7	101.7	101.7	104.9	105.0	104.8	108.3	108.3	108.3
		50	104.9	104.9	105.2	104.5	104.5	104.5	101.8	101.7	101.9	104.9	105.0	105.2	108.3	108.3	108.7
		40	104.9	104.9	105.4	104.5	104.5	104.5	101.8	101.7	102.0	104.9	105.0	105.5	108.3	108.3	108.9
Non-Grad	Y	60	109.8	109.8	109.8	110.5	110.4	110.5	107.2	107.2	107.2	109.6	109.7	109.6	113.5	113.5	113.4
		50	109.8	109.8	110.0	110.5	110.4	110.5	107.2	107.2	107.3	109.6	109.6	109.9	113.4	113.4	113.7
		40	109.8	109.8	110.1	110.5	110.4	110.5	107.2	107.2	107.4	109.6	109.6	110.1	113.4	113.4	113.9
	N	60	109.5	109.5	109.5	110.5	110.4	110.5	107.0	107.1	107.0	109.2	109.2	109.2	113.0	113.0	113.0
		50	109.5	109.5	109.7	110.5	110.4	110.5	107.0	107.1	107.2	109.2	109.2	109.5	113.0	113.0	113.3
		40	109.5	109.5	109.9	110.5	110.4	110.5	107.0	107.1	107.2	109.2	109.2	109.7	113.0	113.0	113.5